United States Department of Agriculture

Natural Resources Conservation Service

In cooperation with the University of Wyoming Agricultural Experiment Station, United States Forest Service, and the Bureau of Land Management

Soil Survey of Campbell County, Wyoming, Southern Part

Part I

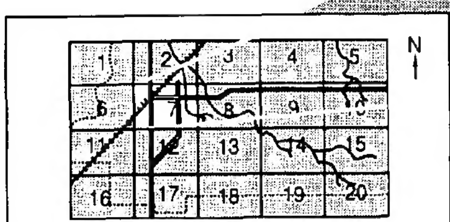
How to Use This Soil Survey

This survey is divided into three parts. Part I includes general information about the survey area; descriptions of the detailed soil map units and soil series in the area; and a description of how the soils formed. Part II describes the use and management of the soils and the major soil properties. This part may be updated as further information about soil management becomes available. Part III includes the maps.

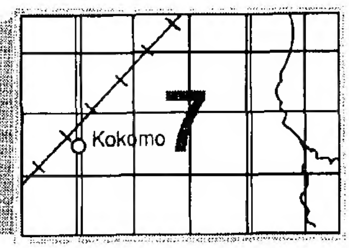
General Soil Map

The general soil map, which is the color map preceding the detailed soil maps, shows the survey area divided into groups of associated soils called general soil map units. This map is useful in planning the use and management of large areas.

To find information about your area of interest, locate that area on the map, identify the name of the map unit in the area on the color-coded map legend, then refer to the section **General Soil Map Units** for a general description of the soils in your area.



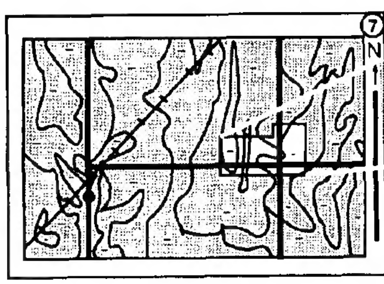
INDEX TO MAP SHEETS



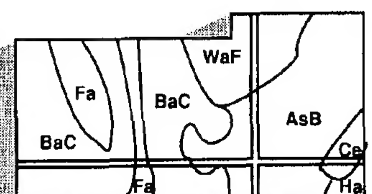
MAP SHEET

Detailed Soil Maps

The detailed soil maps follow the general soil map. These maps can be useful in planning the use and management of small areas.



MAP SHEET



AREA OF INTEREST

NOTE: Map unit symbols in a soil survey may consist only of numbers or letters, or they may be a combination of numbers and letters.

To find information about your area of interest, locate that area in the **Index to Map Sheets**, which precedes the soil maps. Note the number of the map sheet and turn to that sheet.

Locate your area of interest on the map sheet. Note the map unit symbols that are in that area. Turn to the **Contents**, which lists the map units by symbol and name and shows the page where each map unit is described.

The **Contents** shows which table has data on a specific land use for each detailed soil map unit. Also see the **Contents** for sections of this publication that may address your specific needs.

This soil survey is a publication of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (formerly the Soil Conservation Service) has leadership for the Federal part of the National Cooperative Soil Survey.

Major fieldwork for this soil survey was completed in 1993. Soil names and descriptions were approved in 1995. Unless otherwise indicated, statements in this publication refer to conditions in the survey area in 1995. This survey was made cooperatively by the Natural Resources Conservation Service and the Bureau of Land Management, Forest Service, Wyoming Agricultural Experiment Station, and University of Wyoming Extension Service. The survey is part of the technical assistance furnished to the Intermountain Soil and Water Conservation District.

Soil maps in this survey may be copied without permission. Enlargement of these maps, however, could cause misunderstanding of the detail of mapping. If enlarged, maps do not show the small areas of contrasting soils that could have been shown at a larger scale.

Cover: This landform is a result of the resistance of the overlying material (hard conglomerate sandstone and siltstone of the White River formation) to weathering and erosion. The White River formation is more resistant to weathering than the underlying Wasatch formation.

Additional information about the Nation's natural resources is available on the Natural Resources Conservation Service homepage on the World Wide Web. The address is http://www.nrcs.usda.gov.

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Part II

Issued 2004

Summary of Tables

Part I

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Foreword

This soil survey contains information that affects land use planning in this survey area. It contains predictions of soil behavior for selected land uses. The survey also highlights soil limitations, improvements needed to overcome the limitations, and the impact of selected land uses on the environment.

This soil survey is designed for many different users. Farmers, ranchers, foresters, and agronomists can use it to evaluate the potential of the soil and the management needed for maximum food and fiber production. Planners, community officials, engineers, developers, builders, and home buyers can use the survey to plan land use, select sites for construction, and identify special practices needed to ensure proper performance. Conservationists, teachers, students, and specialists in recreation, wildlife management, waste disposal, and pollution control can use the survey to help them understand, protect, and enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. The information in this report is intended to identify soil properties that are used in making various land use or land treatment decisions. Statements made in this report are intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are shallow to bedrock. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

These and many other soil properties that affect land use are described in this soil survey. Broad areas of soils are shown on the general soil map. The location of each soil is shown on the detailed soil maps. Each soil in the survey area is described. Information on specific uses is given for each soil. Help in using this publication and additional information are available at the local office of the Natural Resources Conservation Service or the Cooperative Extension Service.

Lincoln (Ed) Burton
State Conservationist
Natural Resources Conservation Service

Soil Survey of Campbell County, Wyoming, Southern Part

By James W. Westerman and Craig Prink, Natural Resources Conservation Service

Fieldwork by James W. Westerman, Paul J. Lupcho, Andrew E. Kinney, Randall W. White, and Gordon F. Kee, Jr., Natural Resources Conservation Service

United States Department of Agriculture, Natural Resources Conservation Service, in cooperation with
United States Department of Interior, Bureau of Land Management; United States Department of Agriculture, Forest Service; Wyoming Agricultural Experiment Station; and University of Wyoming - Extension Service.

This survey updates the survey "Soil Survey Reconnaissance Campbell County, Wyoming" published in 1955 (USDA, SCS). This survey provides additional information and has larger maps which show the soils in greater detail.

General Nature of the Survey Area

This section gives general information about the survey area. It discusses physiography, relief, and drainage; geology; natural resources; and climate.

Campbell County, Southern Part, is in the northeastern part of Wyoming (fig. 1). The survey area includes that portion of Campbell County south of Township 51 North, with an area of 1,793,243 acres. Of this, about 1,503,601 acres are privately owned, 68,078 acres are administered by the Bureau of Land Management, and 110,844 acres are administered by the Forest Service as part of the Thunder Basin National Grassland. The state administers 110,720 acres.

Agriculture in the survey area is characterized by cattle and sheep production. Approximately 75,000 acres are used for production of commodity crops such as winter wheat, alfalfa hay, and other small grains. The survey area contains significant mineral reserves. Coal, oil, and natural gas are the principle mineral resources produced in the area. This area also provides habitat for a wide variety of game and non-game species. A large population of pronghorn antelope and mule deer inhabit the area.

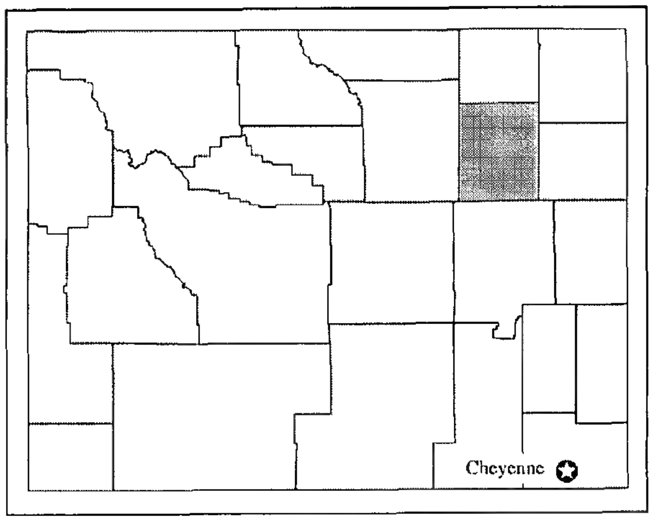

Figure 1. Location of Campbell County, Southern Part, in Wyoming.

This soil survey was made largely to satisfy the demands for resource information brought about by rapid energy development. Most of the mapping was done at an intensity that will facilitate management of the soils for livestock grazing and broad-scale mine land reclamation. In those parts of the survey area where commodity crops are produced, mapping was done so as to facilitate management of the soils for more intense agricultural uses. The lower detail of mapping done on rangeland does not preclude the use of the survey for farm management and reclamation, if the limitations of the lower intensity mapping are duly considered.

This survey area adjoins published surveys in Crook County and Weston County, as well as Converse County, Northern Part and Johnson County, Southern Part. Some of the names of adjoining general soil map units and detailed soil map units in this survey are not the same as those in the adjoining soil surveys. The collection of more recent data on the soils has led to the recorrelation, reclassification, or renaming of map units in the Campbell County, Southern Part survey area.

Physiography, Relief, and Drainage

The survey area is in the southern part of the northern rolling high plains. Much of the area can be characterized as rolling prairies. The Rochelle Hills occur as steep breaks along the eastern edge and support the only continuous stand of coniferous trees in the area. The Pumpkin Buttes stand as landmarks in the southwest corner of the survey area. Elevation ranges from about 4,100 feet where Dead Horse Creek leaves the area in the northwest corner, to 6,052 feet on top of the north Pumpkin Butte. The elevation is 4,544 feet at Gillette and 5,010 feet at Wright. Most of the area is 4,400 to 5,300 feet in elevation.

The survey area is drained by three river basins. The southern and extreme eastern part of the area drains in a southeasterly direction, towards the Cheyenne River in Converse County and Weston County. The major drainages include Bates, Black Thunder, Little Thunder, Ninemile, and Spring Creeks. The central and northern part of the area is drained by the Belle Fourche River, which has its headwaters southeast of the Pumpkin Buttes. Drainage is towards the northeast. Major tributaries include Caballo, Donkey, Hay, and Hoe Creeks. The western edge of the area drains toward the Powder River in Johnson County. The major drainages include Beaver, Cottonwood, Dead Horse, and Pumpkin Creeks.

Geology

P. Stanley Mitchem, geologist, Natural Resources Conservation Service, assisted in the preparation of this section.

Campbell County, Southern Part, lies along the eastern margin of the Powder River structural basin. The basin is bordered by the Bighorn Mountains to the west and the Black Hills to the east. The basin was formed during the Laramide orogeny, at the close of the Cretaceous period, about 60 million years ago. As the mountains rose and were subsequently eroded, the basin filled with sediments. Erosion has since removed some of these sediments and has shaped the remaining ones to create present-day landforms.

During Tertiary time, the survey area was covered intermittently with swamps and marshes, which produced dense, subtropical vegetation. These swamps and marshes were eventually buried by sediments from surrounding landforms. These sediments dip gently to the west and comprise the sandstones and shales of the present Fort Union, Wasatch, and White River Formations which are exposed in the survey area.

The Fort Union formation underlies the entire survey area, but is only exposed at the surface along the eastern one-third. The formation consists of silty and clayey shales and concretionary sandstones. The shale and sandstone members of this formation are exposed in the escarpments and breaks of the Rochelle Hills and drainages along the eastern edge of the survey area. Numerous thin to thick coal seams, a result of the burial of subtropical vegetation once covering the area, occur within this formation and crop out in many areas. The Fort Union Formation is one of the most important coal producers in the state with 8 to 12 feet thick coal seams. One seam, the Wyodak, ranges in thickness from 70 to 120 feet (Brekenridge et al., 1974).

The Wasatch Formation overlies the Fort Union Formation and occurs in the western two-thirds of the survey area. It consists primarily of interbedded sandstone and shale, and has a few coal seams in the lower part of the formation. Many of the areas where Wasatch coals crop out have burned through natural or man-made causes. The fires have left behind beds of hard, red, clinker-like material. This material, locally known as scoria, is porcelanite. Porcelanite is produced by the baking and fusing of clays in shale immediately surrounding the burning coal. The extreme resistance of this material to erosion, coupled with the unequal thickness of the beds, has resulted in the formation of a number of red porcelanite hills ranging in height from less than 20 to more than 100 feet.

The White River formation is the youngest Tertiary bedrock in the survey area. It is composed of hard, semi-cemented conglomeratic sandstone overlying siltstones and shales. Its only occurrence in the survey area is at Pumpkin Buttes, where the resistant sandstone forms a protective cap atop the buttes.

The White River and Wasatch Formation are exposed in the ledges and escarpments which form the sides of the buttes.

Natural Resources

Important natural resources in the survey area are the soil, minerals, and grasses. The mineral resources include coal, oil, and natural gas in addition to construction materials and uranium.

Coal deposits underlie much of the survey area, but with the dip of the bedrock, their proximity to the surface is the least in the eastern one-third of the area. Development and production of these resources has led to significant cultural development in the area. The first open pit coal mine in Wyoming, the Wyodak Resources Mine east of Gillette, opened in 1925. Since that time, nine additional mines have gone into production, and five more are in the planning stages. The survey area has one of the largest coal reserves in the world, The coal reserves of Campbell County could meet the nation's needs for the next 200 years (Lageson and Spearing, 1988). The county currently produces over 80 percent of coal produced in the Wyoming, and by 1995, is expected to produce nearly 200 million tons annually (Jones, 1991.)

Commercial oil and gas activity in Campbell County began in the late 1940s, but the first significant oil discovery occurred in 1956 at Raven Creek in the northeastern part of the survey area. Discovery of the Hilight field in February 1969, with over 200 producing wells, is the largest field in the county, and was one of the more significant finds in northeastern Wyoming. Two fields, Hartzog Draw and Buck Draw North, currently rank among the top oil producers in the state (De Bruin, 1990). Since the late 1980s, coal bed methane gas exploration and production has begun in the central areas of the county.

While the future of uranium mining in the United States and Wyoming is uncertain, Wyoming had for many years been the leading uranium-producing state (Harris, 1990). Commercial grade uranium was first discovered in Wyoming at Pumpkin Buttes in 1951. Since 1953, a total of at least 56 different mines have been in operation in the survey area (Brekenridge, 1974). At present, two in-situ uranium mines are proposed in this area (Jones, 1991).

Numerous sand, gravel, and scoria pits can be found in the survey area. These materials are used for aggregate, highway and railroad construction, and other building purposes. Sands and gravels occur as alluvial deposits and are limited primarily to the low terraces along the Belle Fourche River. Scoria deposits occur erratically throughout the eastern and north-central part of the survey area. The suitability of scoria varies considerably, but it has been quarried and used as road gravel, creating red-colored roads (Lageson and Spearing, 1988).

Climate

The table, "Temperature and Precipitation," gives data on temperature and precipitation for the survey area as recorded at Gillette, Wyoming in the period 1961 to 1990. The table shows probable dates of the first freeze in fall and the last freeze in spring. The table, "Freeze Dates in Spring and Fall," provides data on length of the growing season.

In winter, the average temperature is 23.4 degrees F and the average daily minimum temperature is 12.8 degrees. In summer, the average temperature is 67.5 degrees and the average daily maximum temperature is 82.5 degrees.

Growing degree days are shown in the first table. They are equivalent to "heat units." During the month, growing degree days accumulate by the amount that the average temperature each day exceeds a base temperature (40 degrees F). The normal monthly accumulation is used to schedule single or successive plantings of a crop between the last freeze in spring and the first freeze in fall.

The total annual precipitation is about 16.7 inches. Of this, 12.2 inches, or 73 percent, usually falls in April through September. The growing season for most crops falls within this period. In 3 years out of 10, the rainfall in April through September is less than 6.9 inches. Thunderstorms occur on about 26 days each year, and most occur in April through July.

The average seasonal snowfall is about 66 inches.

How This Survey Was Made

This survey was made to provide information about the soils and miscellaneous areas in the survey area. The information includes a description of the soils and miscellaneous areas and their location and a discussion of their suitability, limitations, and management for specified uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They dug many holes to study the soil

profile, which is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

The soils and miscellaneous areas in the survey area are in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept or model of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

The descriptions, names, and delineations of the soils in this survey area do not fully agree with those of the soils in adjacent survey areas. Differences are the result of a better knowledge of soils, modifications in series concepts, variations in the intensity of mapping, or in the extent of the soils in the survey areas.

Temperature and Precipitation

(Recorded in the period 1961-90 at Gillette, Wyoming)

Month	Temperature						Precipitation				
	Average daily maximum	Average daily minimum	Average	2 years in 10 will have-- Maximum temperature higher than--	2 years in 10 will have-- Minimum temperature lower than--	Average number of growing degree days*	Average	2 years in 10 will have-- Less than--	2 years in 10 will have-- More than--	Average number of days with 0.10 inch or more	Average total snow-fall
January----	31.6	10.3	20.9	56	-25	3	0.54	0.24	0.79	1	9.3
February---	36.8	15.6	26.2	60	-19	10	0.56	0.26	0.82	1	8.8
March------	44.7	21.8	33.3	70	-9	48	0.83	0.47	1.14	2	10.9
April------	55.6	30.5	43.1	81	9	165	1.86	0.86	2.72	5	9.9
May--------	65.5	39.8	52.7	88	23	399	2.97	1.33	4.38	6	3.1
June-------	76.6	48.8	62.7	98	33	677	3.02	1.36	4.45	5	0.1
July-------	86.2	55.1	70.7	102	41	951	1.68	0.86	2.40	3	0.0
August-----	84.8	53.3	69.0	100	37	898	1.25	0.39	1.95	3	0.0
September--	72.9	43.2	58.1	95	23	546	1.46	0.51	2.24	3	1.2
October----	60.6	33.6	47.1	83	11	264	1.24	0.58	1.88	3	4.3
November---	44.1	21.8	33.0	71	-9	51	0.69	0.34	0.99	2	8.2
December---	33.6	12.5	23.1	61	-25	11	0.63	0.31	0.91	2	10.8
Yearly:											
Average---	57.7	32.2	45.0	---	---	---	---	---	---	---	
Extreme---	107	-37	---	103	-30	---	---	---	---	---	
Total-----	---	---	---	---	---	4,023	16.72	14.03	19.18	36	66.6

* A growing degree day is a unit of heat available for plant growth. It can be calculated by adding the maximum and minimum daily temperatures, dividing the sum by 2, and subtracting the temperature below which growth is minimal for the principal crops in the area (40 degrees F).

Freeze Dates in Spring and Fall

(Recorded in the period 1961-90 at Gillette, Wyoming)

Probability	Temperature		
	24° F or lower	28° F or lower	32° F or lower
Last freezing temperature in spring:			
1 year in 10 later than--	May 9	May 23	June 1
2 years in 10 later than--	May 3	May 17	May 27
5 years in 10 later than--	April 22	May 5	May 19
First freezing temperature in fall:			
1 year in 10 earlier than--	Sept. 21	Sept. 12	Sept. 3
2 years in 10 earlier than--	Sept. 27	Sept. 18	Sept. 9
5 years in 10 earlier than--	Oct. 7	Sept. 30	Sept. 20

General Soil Map Units

The general soil map in Part III of this publication shows broad areas that have a distinctive pattern of soils, relief, and drainage. Each map unit on the general soil map is a unique natural landscape. Typically, a map unit consists of one or more major soils or miscellaneous areas and some minor soils or miscellaneous areas. It is named for the major soils or miscellaneous areas. The components of one map unit can occur in another but in a different pattern.

The general soil map can be used to compare the suitability of large areas for general land uses. Areas of suitable soils can be identified on the map. Likewise, areas where the soils are not suitable can be identified. Because of its small scale, the map is not suitable for planning the management of a farm or field or for selecting a site for a road, building, or other structure. The soils in any one map unit differ from place to place in slope, depth, drainage, and other characteristics that affect management.

The general soil map units in this survey have been grouped into general kinds of landscape for broad interpretive purposes. Each of the broad groups and the map units in each group are described in the following pages.

The State Soil Geographic Data Base (STATSGO) for Wyoming is the base for the General Soil Map of Campbell County, Wyoming, Southern Part. Map symbols are the same as for the STATSGO map units. In each major soil group one, two, or three of the major soils or miscellaneous land types that occur within the map unit are listed for the map symbol in the survey area. For more information about the general soil map units refer to the STATSGO map for Wyoming.

Soils on the Uplands

Areas on alluvial fans, buttes, fan remnants, terraces, hills, plateaus, and ridges of dominantly shallow, moderately deep, and very deep soils

53—Cushman-Forkwood-Shingle Association

Nearly level to moderately steep, shallow to very deep, medium textured soils on alluvial fans, fan remnants, hills, and ridges

This unit is about 25 percent Cushman and similar soils, 25 percent Forkwood and similar soils, and 15 percent Shingle and similar soils. Slopes are 0 to 30 percent.

The nearly level to moderately sloping Cushman soils are on hills and ridges. They are moderately deep over interbedded sandstone and shale. The surface soil is loam about 2 inches thick. The subsoil is loam in the upper part, clay loam in the next part, and loam in the lower part. The substratum is soft shale.

The nearly level to moderately sloping Forkwood soils are on alluvial fans, fan remnants, hills, and ridges. They are very deep. The surface soil is loam about 2 inches thick. The subsoil is clay loam in the upper part and loam in the lower part.

The moderately sloping and moderately steep Shingle soils are on hills and ridges. They are shallow over interbedded sandstone and shale. The surface soil is loam about 2 inches thick. The substratum is loam in the upper part and soft shale in the lower part.

The Cushman and Forkwood soils are used for livestock grazing, hayland and pasture, and wildlife habitat. The Shingle soils are used primarily for livestock grazing and wildlife habitat. The production of vegetation suitable for livestock grazing is limited by low annual precipitation and by the very low available water capacity and limited rooting depth of the Shingle soil. If the Cushman and Forkwood soils are used for hayland and pasture, the main limitation is low annual precipitation.

This unit provides summer habitat for antelope. Sage grouse leks (breeding areas) also occur in this

unit. The area north of Interstate 90 on the eastern county line is important antelope winter habitat. Important mule deer habitat occurs along the eastern county line south of the Belle Fourche River.

Included in this unit is habitat for species such as white-tailed and black-tailed jackrabbit, thirteen-lined ground squirrel, Ord's kangaroo rat, desert cottontail, coyote, red fox, badger, and birds common to shrub steppes.

114—Forkwood-Terro-Cushman Association

Nearly level to moderately sloping, moderately deep to very deep, moderate coarse and medium textured soils on alluvial fans, fan remnants, hills, and ridges

This unit is about 30 percent Forkwood and similar soils, 20 percent Terro and similar soils, and 15 percent Cushman and similar soils. Slopes are 0 to 15 percent.

The nearly level to moderately sloping Forkwood soils are on alluvial fans, fan remnants, hills, and ridges. They are very deep. The surface soil is loam about 2 inches thick. The subsoil is clay loam in the upper part and loam in the lower part.

The gently sloping and moderately sloping Terro soils are on hills and ridges. They are moderately deep over sandstone. The surface soil is fine sandy loam about 3 inches thick. The subsoil is fine sandy loam. The substratum is soft sandstone.

The nearly level to moderately sloping Cushman soils are on hills and ridges. They are moderately deep over interbedded sandstone and shale. The surface soil is loam about 2 inches thick. The subsoil is loam in the upper part and clay loam in the lower part. The substratum is soft shale.

The Cushman and Forkwood soils are used for livestock grazing, hayland and pasture, and wildlife habitat. The Terro soils are used primarily for livestock grazing and wildlife habitat. The production of vegetation suitable for livestock grazing is limited by low annual precipitation. If the Cushman and Forkwood soils are used for hayland and pasture, the main limitation is low annual precipitation.

This unit provides year-round habitat for antelope. Included in this unit is habitat for species such as white-tailed and black-tailed jackrabbits, thirteen-lined ground squirrel, Ord's kangaroo rat, desert cottontail, coyote, red fox, badger, and birds common to shrub steppes and pastures.

126—Arwite-Vonalf-Moorhead Association

Nearly level to moderately sloping, very deep, moderately coarse, medium, and fine textured soils on alluvial fans, fan remnants, hills, and ridges

This unit is about 30 percent Arwite and similar soils, 20 percent Vonalf and similar soils, and 15 percent Moorhead and similar soils. Slopes are 0 to 15 percent.

The nearly level to moderately sloping Arwite soils are on alluvial fans, fan remnants, hills, and ridges. They are very deep. The surface soil is fine sandy loam about 5 inches thick. The subsoil is sandy clay loam in the upper part and fine sandy loam in the lower part.

The nearly level to moderately sloping Vonalf soils are on alluvial fans, fan remnants, hills, and ridges. They are very deep. The surface soil is fine sandy loam about 6 inches thick. The subsoil is fine sandy loam.

The nearly level to moderately sloping Moorhead soils are on alluvial fans, fan remnants, hills, and ridges. They are very deep. The surface soil is loam or clay loam about 4 inches thick. The subsoil is clay in the upper part and clay loam in the lower part.

This unit is used for rangeland, hayland and pasture, nonirrigated cropland, and wildlife habitat. The production of vegetation suitable for livestock grazing is limited by low annual precipitation. If the Arwite and Vonalf soils are used for nonirrigated cropland, the main limitations are low annual precipitation and severe hazard of wind erosion. If the Moorhead soils are used for nonirrigated cropland, the main limitations are low annual precipitation and moderate hazard of wind and water erosion.

All of this unit provides summer habitat for antelope. Important antelope winter habitat occurs southeast of Gillette and near the Belle Fourche River. Important mule deer winter habitat occurs along the eastern county line south of the Belle Fourche River. Several sage grouse leks, black-tailed prairie dog towns, and golden eagle nests occur on this unit.

Included in this unit is habitat for species such as white-tailed and black-tailed jackrabbits, thirteen-lined ground squirrel, Ord's kangaroo rat, desert cottontail, coyote, red fox, badger, and birds common to shrub steppes, pastures, and prairies.

128—Renohill-Cushman-Shingle Association

Gently sloping to moderately steep, shallow and moderately deep, medium and fine textured soils on hills and ridges

This unit is about 30 percent Renohill and similar soils, 25 percent Cushman and similar soils, and 15 percent Shingle and similar soils. Slopes are 3 to 30 percent.

The gently sloping and moderately sloping Renohill soils are on hills and ridges. They are moderately deep over shale. The surface soil is clay loam about 4 inches thick. The subsoil is clay loam in the upper part, clay in the next part, and clay loam in the lower part. The substratum is soft shale.

The gently sloping and moderately sloping Cushman soils are on hills and ridges. They are moderately deep over interbedded sandstone and shale. The surface soil is loam about 2 inches thick. The subsoil is loam in the upper part, clay loam in the next part, and loam in the lower part. The substratum is soft shale.

The moderately sloping and moderately steep Shingle soils are on hills and ridges. They are shallow over interbedded sandstone and shale. The surface soil is loam about 2 inches thick. The substratum is loam in the upper part and soft shale in the lower part.

This unit is used for livestock grazing and wildlife habitat. The production of vegetation suitable for livestock grazing is limited by low annual precipitation and by the very low available water capacity and limited rooting depth of the Shingle soils.

All of this unit provides important year-round habitat for antelope and summer habitat for mule deer. Sage grouse leks, golden eagle nests, and prairie dog towns occur on this unit.

Included in this unit is habitat for species such as white-tailed and black-tailed jackrabbits, thirteen-lined ground squirrel, Ord's kangaroo rat, desert cottontail, coyote, red fox, badger, and birds common to shrub steppes, pasture, prairies, and nonirrigated wheat fields.

130—Forkwood-Ulm-Cushman Association

Nearly level to moderately sloping, moderately deep to very deep, medium and fine textured soils on alluvial fans, fan remnants, hills, and ridges

This unit is about 30 percent Forkwood and similar soils, 25 percent Ulm and similar soils, and 20 percent Cushman and similar soils. Slopes are 0 to 15 percent.

The nearly level to moderately sloping Forkwood soils are on alluvial fans, fan remnants, hills, and ridges. They are very deep. The surface soil is loam about 2 inches thick. The subsoil is clay loam in the upper part and loam in the lower part.

The nearly level and gently sloping Ulm soils are on alluvial fans, fan remnants, hills, and ridges. They are very deep. The surface soil is loam or clay loam about 5 inches thick. The subsoil is clay in the upper part and clay loam in the lower part.

The nearly level to moderately sloping Cushman soils are on hills and ridges. They are moderately deep over interbedded sandstone and shale. The surface soil is loam about 2 inches thick. The subsoil is loam in the upper part, clay loam in the next part, and loam in the lower part. The substratum is soft shale.

This unit is used for livestock grazing, nonirrigated cropland, hayland and pasture, and wildlife habitat. The production of vegetation suitable for livestock grazing is limited by low annual precipitation. If this unit is used for hayland and pasture, the main limitation is low annual precipitation.

All of this unit provides important year-round habitat for antelope and summer habitat for mule deer. Numerous sage grouse leks and golden eagle nests occur on this unit.

Included in this unit is habitat for species such as white-tailed and black-tailed jackrabbit, thirteen-lined ground squirrel, Ord's kangaroo rat, desert cottontail, coyote, red fox, badger, and birds common to shrub steppes, pasture, prairies, and nonirrigated wheat fields.

208—Samday-Shingle-Badland Association

Moderately sloping to steep, shallow, medium and fine textured soils and Badland on hills and ridges

This unit is about 25 percent Samday and similar soils, 25 percent Shingle and similar soils, and 15 percent Badland. Slopes are 6 to 60 percent.

The moderately sloping Samday soils are on hills and ridges. They are shallow over shale. The surface soil is clay loam about 2 inches thick. The substratum is silty clay in the upper part and soft shale in the lower part.

The moderately sloping to steep Shingle soils are on hills and ridges. They are shallow over interbedded sandstone and shale. The surface soil is loam about 2 inches thick. The substratum is loam in the upper part and soft shale in the lower part.

Badland consists of interbedded sandstone and shale.

This unit is used for livestock grazing and wildlife habitat. The production of vegetation suitable for livestock grazing on the Samday and Shingle soils is limited by low annual precipitation, very low available water capacity, and limited rooting depth.

All of this unit provides important year-round habitat for antelope and summer habitat for mule deer.

Included in this unit is habitat for species such as white-tailed and black-tailed jackrabbits, thirteen-lined ground squirrel, Ord's kangaroo rat, desert cottontail, coyote, red fox, badger, and birds common to shrub steppes, pastures, prairies, and Badland.

209—Hiland-Ulm-Shingle Association

Gently sloping to moderately steep, shallow and very deep, medium and fine textured soils on alluvial fans, fan remnants, hills, and ridges

This unit is about 30 percent Hiland and similar soils, 25 percent Ulm and similar soils, and 15 percent Shingle and similar soils. Slopes are 3 to 30 percent.

The gently sloping and moderately sloping Hiland soils are on alluvial fans, fan remnants, hills, and ridges. They are very deep. The surface soil is fine sandy loam about 2 inches thick. The subsoil is sandy clay loam in the upper part and sandy loam in the lower part.

The gently sloping Ulm soils are on alluvial fans, fan remnants, hills, and ridges. They are very deep. The surface soil is loam or clay loam about 4 inches thick. The subsoil is clay in the upper part and clay loam in the lower part.

The gently sloping to moderately steep Shingle soils are on hills and ridges. They are shallow over interbedded sandstone and shale. The surface soil is loam about 2 inches thick. The substratum is loam in the upper part and soft shale in the lower part.

This unit is used for livestock grazing and wildlife habitat. The production of vegetation suitable for livestock grazing is limited by low annual precipitation and by the very low available water capacity and limited rooting depth of the Shingle soils.

All of this unit provides summer habitat for antelope and mule deer. The western half of this unit provides important antelope winter habitat. Numerous sage grouse leks, golden eagle nests, and prairie dog towns occur on this unit.

Included in this unit is habitat for species such as white-tailed and black-tailed jackrabbits, thirteen-lined ground squirrel, Ord's kangaroo rat, desert cottontail, coyote, red fox, badger, and birds common to shrub steppes, pastures, and prairies.

210—Bidman-Parmleed-Arvada Association

Nearly level to moderately sloping, moderately deep and very deep, fine textured soils on alluvial fans, fan remnants, stream terraces, hills, and ridges

This unit is about 30 percent Bidman and similar soils, 25 percent Parmleed and similar soils, and 15 percent Arvada and similar soils. Slopes are 0 to 15 percent.

The nearly level to moderately sloping Bidman soils are on alluvial fans, fan remnants, stream terraces, hills, and ridges. They are very deep. The surface soil is loam about 2 inches thick. The subsoil is clay in the upper part and clay loam in the lower part.

The gently sloping and moderately sloping Parmleed soils are on hills and ridges. They are moderately deep over shale. The surface soil is loam about 3 inches thick. The subsoil is clay loam in the upper part, clay in the next part, and clay loam in the lower part. The substratum is soft shale.

The nearly level and gently sloping Arvada soils are on alluvial fans, fan remnants, and stream terraces. They are very deep. The surface soil is fine sandy loam about 2 inches thick. The subsoil is very strongly alkaline and strongly saline clay in the upper part and very strongly alkaline and strongly saline silty clay loam and clay loam in the lower part. The substratum is strongly alkaline and strongly saline clay loam.

The Bidman and Parmleed soils are used for livestock grazing, hayland and pasture, and wildlife habitat. Arvada soils are used for livestock grazing and wildlife habitat. The production of vegetation suitable for livestock grazing on this unit is limited by low annual precipitation and by the high alkalinity and high salinity of the Arvada soils. If the Bidman and Parmleed soils are used for hayland and pasture, the main limitation is low annual precipitation.

All of this unit provides summer habitat for antelope. The lower slopes of the Hay Creek, Little Thunder Creek, and Coal Creek watersheds in the southeast corner of the survey area provide important antelope winter habitat. Numerous sage grouse leks and an occasional golden eagle nest occur on this unit.

Included in this unit is habitat for species such as white-tailed and black-tailed jackrabbits, thirteen-lined ground squirrel, Ord's kangaroo rat, desert cottontail, coyote, red fox, badger, and birds common to shrub steppes, pastures, and prairies.

211—Bowbac-Cushman-Taluce Association

Gently sloping to moderately steep, shallow and moderately deep, moderately coarse and medium textured soils on buttes, hills, and ridges

This unit is about 25 percent Bowbac and similar soils, 25 percent Cushman and similar sols, and 15 percent Taluce and similar soils. Slopes are 3 to 30 percent.

The gently sloping and moderately sloping Bowbac soils are on buttes, hills, and ridges. They are moderately deep over sandstone. The surface soil is fine sandy loam about 3 inches thick. The subsoil is sandy clay loam in the upper part and sandy loam in the lower part. The substratum is slightly hard sandstone.

The gently sloping and moderately sloping Cushman soils are on buttes, hills, and ridges. They are moderately deep over sandstone and shale. The surface soil is loam about 2 inches thick. The subsoil is loam in the upper part, clay loam in the next part, and loam in the lower part. The substratum is soft shale.

The moderately sloping and moderately steep Taluce soils are on hills and ridges. They are shallow over sandstone. The surface soil is sandy loam about 2 inches thick. The substratum is fine sandy loam in the upper part and soft sandstone in the lower part.

This unit is used for livestock grazing and wildlife habitat. The production of vegetation suitable for livestock grazing is limited by low annual precipitation and by the very low available water capacity and limited rooting depth of the Taluce soils.

Most of this unit provides summer habitat for mule deer. Areas along the eastern boundary are critical winter and year-round habitat for elk and mule deer. Numerous golden eagle and prairie falcon nests are present.

Included in this unit is habitat for species such as white-tailed and black-tailed jackrabbits, thirteen-lined ground squirrel, Ord's kangaroo rat, desert cottontail, coyote, red fox, badger, and birds common to shrub steppes, pastures, prairies, and Badland.

369—Wibaux-Bidman-Teckla Association

Nearly level to steep, very deep, medium and fine textured soils on alluvial fans, fan remnants, hills, ridges, and terraces (fig. 2)

This unit is about 35 percent Wibaux and similar soils, 20 percent Bidman and similar soils, and 15 percent Teckla and similar soils. Slopes are 0 to 60 percent.

The moderately sloping to steep Wibaux soils are on hills and ridges. They are very deep. The surface soil is channery fine sandy loam about 3 inches thick. The substratum is very channery loam in the upper part and fractured porcelanite in the lower part.

The nearly level to moderately sloping Bidman soils are on alluvial fans, fan remnants, hills, and ridges. They are very deep. The surface soil is loam about 2 inches thick. The subsoil is clay in the upper part and clay loam in the lower part.

The nearly level to moderately sloping Teckla soils are on terraces. They are very deep. The surface soil is very fine sandy loam about 10 inches thick. The subsoil is sandy clay loam in the upper part, channery loam in the next part, and very channery loam in the lower part. The substratum is extremely channery sandy loam.

This unit is used for livestock grazing and wildlife habitat. The production of vegetation suitable for livestock grazing is limited by low annual precipitation and by the very low available water capacity and limited rooting depth of the Wibaux soils.

All of this unit provides summer habitat for antelope and mule deer. The area of this map unit north of Little Thunder Creek provides important winter habitat for antelope. Sage grouse leks also occur in this area. The area of this map unit south of Little Thunder Creek includes sage grouse leks and prairie dog towns. The area of this map unit north of Reno Junction provides important winter habitat for antelope and nesting habitat for golden eagles. The area of this map unit north of Interstate 90 provides important winter habitat for antelope.

Figure 2. Typical landforms in General Soil Map Unit 369—Wibaux-Bidman-Teckla. Wibaux soils occur on hills and ridges like those in the background. Bidman and Teckla soils occur on the lesser sloping areas.

Included in this unit is habitat for species such as white-tailed and black-tailed jackrabbits, thirteen-lined ground squirrel, Ord's kangaroo rat, desert cottontail, coyote, red fox, badger, and birds common to shrub steppes, pastures, and prairies.

382—Hilight-Wags-Wibaux Association

Gently sloping to steep, shallow to very deep, medium and fine textured soils on hills and ridges

This unit is about 25 percent Hilight and similar soils, 20 percent Wags and similar soils, and 20 percent Wibaux and similar soils. Slopes are 3 to 60 percent.

The gently sloping to steep Hilight soils are on hills and ridges. They are shallow over shale. The surface soil is clay about 2 inches thick. The substratum is clay in the upper part and lignitic shale in the lower part.

The gently sloping to moderately steep Wags soils are on hills and ridges. They are moderately deep over shale. The surface soil is clay loam about 1 inch thick. The substratum is silty clay in the upper part and soft shale in the lower part.

The moderately sloping to steep Wibaux soils are on hills and ridges. They are very deep. The surface soil is channery fine sandy loam about 3 inches thick. The substratum is very channery loam in the upper part and fractured porcelanite in the lower part.

This unit is used for livestock grazing and wildlife habitat. The production of vegetation suitable for livestock grazing is limited by low annual precipitation, low to very low available water capacity, and by the limited rooting depth of the Hilight and Wibaux soils.

All of this unit provides summer habitat for antelope and mule deer. The Coal Creek watershed provides important antelope winter habitat. An area south of the Belle Fourche River along the eastern

county line provides important mule deer winter habitat. Crucial winter habitat for elk occurs along the county line in the areas northeast of Bacon Creek and south of Little Thunder Creek. Numerous sage grouse leks and golden eagle nests occur throughout the unit. The area of this map unit in the southeast corner of the survey area has a high density of golden eagle nests, prairie dog towns, and prairie falcon nests. This unit is also used by wintering bald eagles.

Included in this unit is habitat for species such as white-tailed and black-tailed jackrabbits, thirteen-lined ground squirrel, Ord's kangaroo rat, desert cottontail, coyote, red fox, badger, and birds common to shrub steppes, pastures, prairies, and ponderosa pine.

383—Shingle-Wibaux-Badland Association

Moderately sloping to steep, shallow to very deep, medium textured soils and Badland on hills and ridges

This unit is about 30 percent Shingle and similar soils, 25 percent Wibaux and similar sols, and 15 percent Badland. Slopes are 6 to 60 percent.

The moderately sloping and moderately steep Shingle soils are on hills and ridges. They are shallow over interbedded sandstone and shale. The surface soil is loam about 2 inches thick. The substratum is loam in the upper part and soft shale in the lower part.

The moderately sloping to steep Wibaux soils are on hills and ridges. They are very deep. The surface soil is channery fine sandy loam about 3 inches thick. The substratum is very channery loam in the upper part and fractured porcelanite in the lower part.

Badland consists of interbedded sandstone and shale.

This unit is used for livestock grazing and wildlife habitat. The production of vegetation suitable for livestock grazing on the Shingle and Wibaux soils is limited by low annual precipitation, very low available water capacity, and limited rooting depth.

All of this unit provides summer habitat for antelope and mule deer. There is a high density of prairie dog towns in this unit. Wintering bald eagles use this area.

Included in this unit is habitat for species such as white-tailed and black-tailed jackrabbits, thirteen-lined ground squirrel, Ord's kangaroo rat, desert cottontail, coyote, red fox, badger, and birds common to shrub steppes, pastures, prairies, and Badland.

384—Cambria-Theedle-Kishona Association

Gently sloping to moderately steep, moderately deep and very deep, medium textured soils on alluvial fans, fan remnants, hills, and ridges

This unit is about 30 percent Cambria and similar soils, 30 percent Theedle and similar soils, and 15 percent Kishona and similar soils. Slopes are 3 to 30 percent.

The gently sloping and moderately sloping Cambria soils are on alluvial fans, fan remnants, hills, and ridges. They are very deep. The surface soil is loam about 2 inches thick. The subsoil is clay loam in the upper part and loam in the lower part.

The gently sloping to moderately steep Theedle soils are on hills and ridges. They are moderately deep over interbedded sandstone and shale. The surface soil is loam about 2 inches thick. The subsoil is loam in the upper part and clay loam in the lower part. The substratum is soft shale.

The gently sloping and moderately sloping Kishona soils are on alluvial fans, fan remnants, hills, and ridges. They are very deep. The surface soil is loam about 5 inches thick. The subsoil is clay loam.

This unit is used for livestock grazing and wildlife habitat. The production of vegetation suitable for livestock grazing is limited by low annual precipitation.

All of this unit provides winter and year-round habitat for antelope and summer habitat for mule deer. The lower slopes of Beaver Creek, Pumpkin Creek, Willow Creek, Cottonwood Creek, and upper Dry Fork Creek watersheds provide important mule deer winter habitat. Several sage grouse leks occur on this unit.

Included in this unit is habitat for species such as white-tailed and black-tailed jackrabbits, thirteen-lined ground squirrel, Ord's kangaroo rat, desert cottontail, coyote, red fox, badger, and birds common to shrub steppes, pastures, and prairies.

385—Ucross-Deekay-Fairburn Association

Nearly level to moderately steep, shallow to very deep, medium textured soils on alluvial fans, fan remnants, hills, and ridges

This unit is about 30 percent Ucross and similar soils, 25 percent Deekay and similar soils, and 15 percent Fairburn and similar soils. Slopes are 0 to 30 percent.

The gently sloping to moderately steep Ucross soils are on hills and ridges. They are moderately deep over interbedded sandstone and shale. The surface soil is loam about 5 inches thick. The subsoil is clay loam. The substratum is soft shale.

The nearly level to moderately sloping Deekay soils are on alluvial fans, fan remnants, hills, and ridges. They are very deep. The surface soil is loam about 4 inches thick. The subsoil is clay loam in the upper part and loam in the lower part.

The gently sloping to moderately steep Fairburn soils are on hills and ridges. They are shallow over interbedded sandstone and shale. The surface soil is loam about 4 inches thick. The substratum is loam in the upper part and soft shale in the lower part.

The Ucross and Fairburn soils are used primarily for livestock grazing and wildlife habitat. The Deekay soils are used for livestock grazing, hayland and pasture, and wildlife habitat. The production of vegetation suitable for livestock grazing is limited by low annual precipitation and by the very low available water capacity and limited rooting depth of the Fairburn soils. If the Deekay soils are used for hayland and pasture, the main limitation is low annual precipitation.

All of this unit provides summer habitat for antelope and mule deer. The area north of Interstate 90 provides important antelope winter habitat. Sage grouse leks also occur in this unit.

Included in this unit is habitat for species such as white-tailed and black-tailed jackrabbits, thirteen-lined ground squirrel, Ord's kangaroo rat, desert cottontail, coyote, red fox, badger, and birds common to shrub steppes, pastures, and prairies.

386—Deekay-Moorhead-Oldwolf Association

Nearly level to moderately sloping, moderately deep and very deep, medium and fine textured soils on alluvial fans, fan remnants, hills, and ridges

This unit is about 30 percent Deekay and similar soils, 25 percent Moorhead and similar soils, and 20 percent Oldwolf and similar soils. Slopes are 0 to 15 percent.

The nearly level to moderately sloping Deekay soils are on alluvial fans, fan remnants, hills, and ridges. They are very deep. The surface soil is loam about 4 inches thick. The subsoil is clay loam in the upper part and loam in the lower part.

The nearly level to moderately sloping Moorhead soils are on alluvial fans, fan remnants, hills, and ridges. They are very deep. The surface soil is clay loam about 4 inches thick. The subsoil is clay in the upper part and clay loam in the lower part.

The nearly level to moderately sloping Oldwolf soils are on hills and ridges. They are moderately deep over interbedded sandstone and shale. The surface soil is loam about 5 inches thick. The subsoil is clay loam in the upper part and loam in the lower part. The substratum is shale.

This unit is used for livestock grazing, hayland and pasture, nonirrigated cropland, and wildlife habitat. The production of vegetation suitable for livestock grazing is limited by low annual precipitation. If this unit is used for hayland and pasture, the main limitation is low annual precipitation. If this unit is used for nonirrigated cropland, the main limitations are low annual precipitation and moderate hazard of wind and water erosion.

Included in this unit is habitat for species such as white-tailed and black-tailed jackrabbits, thirteen-lined ground squirrel, Ord's kangaroo rat, desert cottontail, coyote, red fox, badger, and birds common to shrub steppes, pastures, prairies, and nonirrigated wheat fields.

387—Theedle-Shingle-Samday Association

Gently sloping to steep, shallow and moderately deep, medium and fine textured soils on hills and ridges

This unit is about 30 percent Theedle and similar soils, 25 percent Shingle and similar soils, and 20 percent Samday and similar soils. Slopes are 3 to 60 percent.

The gently sloping to moderately steep Theedle soils are on hills and ridges. They are moderately deep over interbedded sandstone and shale. The surface soil is loam about 2 inches thick. The subsoil is loam in the upper part and clay loam in the lower part. The substratum is soft shale.

The moderately sloping to steep Shingle soils are on hills and ridges. They are shallow over interbedded sandstone and shale. The surface soil is loam about 2 inches thick. The substratum is loam in the upper part and soft shale in the lower part.

The moderately sloping Samday soils are on hills and ridges. They are shallow over shale. The surface soil is clay loam about 2 inches thick. The substratum is silty clay in the upper part and soft shale in the lower part.

This unit is used for livestock grazing and wildlife habitat. The production of vegetation suitable for

livestock grazing is limited by low annual precipitation and by the very low available water capacity and limited rooting depth of the Shingle and Samday soils.

All areas of this unit provide year-round habitat for antelope and mule deer. The northern half of the area of this map unit located along the western county line provides important winter habitat for antelope. The low slopes of the Barber Creek, Dead Horse Creek, Beaver Creek, and Pumpkin Creek watersheds provide important mule deer winter habitat. Sage grouse leks occur on this unit.

Included in this unit is habitat for species such as white-tailed and black-tailed jackrabbits, thirteen-lined ground squirrel, Ord's kangaroo rat, desert cottontail, coyote, red fox, and birds common to shrub steppes, pastures, and prairies.

398—Ironbutte-Jaywest-Rockybutte Association

Nearly level to steep, very deep, medium and fine textured soils on hills, plateaus, and ridges

This unit is about 35 percent Ironbutte and similar soils, 20 percent Jaywest and similar soils, and 15 percent Rockybutte and similar soils. Slopes are 0 to 60 percent.

The moderately sloping to steep Ironbutte soils are on hills and ridges. They are very deep. The surface soil is channery loam about 4 inches thick. The substratum is very channery loam in the upper part and fractured porcelanite in the lower part.

The nearly level and gently sloping Jaywest soils are on hills and ridges. They are very deep. The surface soil is loam about 7 inches thick. The subsoil is clay loam in the upper part, clay in the next part, and clay loam in the lower part.

The nearly level to moderately sloping Rockybutte soils are on plateaus and ridges. They are very deep. The surface soil is loam about 4 inches thick.The subsoil, in sequence downward, is clay loam, channery clay loam, very channery clay loam, and extremely channery loam. The substratum is fractured porcelanite.

This unit is used for livestock grazing and wildlife habitat. The production of vegetation suitable for livestock grazing is limited by low annual precipitation and by the very low available water capacity and limited rooting depth of the Wibaux soils.

All of this unit provides summer habitat for antelope and mule deer. The area of this map unit north of Little Thunder Creek provides important winter habitat for antelope. Sage grouse leks also occur in this area. The area of this map unit south of Little Thunder Creek includes sage grouse leks and prairie dog towns. The area of this map unit north of Reno Junction provides important winter habitat for antelope and nesting habitat for golden eagles. The area of this map unit north of Interstate 90 provides important winter habitat for antelope.

Included in this unit is habitat for species such as white-tailed and black-tailed jackrabbits, thirteen-lined ground squirrel, Ord's kangaroo rat, desert cottontail, coyote, red fox, badger, and birds common to shrub steppes, pastures, and prairies.

399—Lismas-Sabatka-Ironbutte Association

Gently sloping to steep, shallow to very deep, medium and fine textured soils on hills and ridges

This unit is about 25 percent Lismas and similar soils, 20 percent Sabatka and similar soils, and 20 percent Ironbutte and similar soils. Slopes are 3 to 60 percent.

The gently sloping to steep Lismas soils are on hills and ridges. They are shallow over shale. The surface soil is clay loam about 3 inches thick. The substratum is clay in the upper part and shale in the lower part.

The gently sloping to moderately steep Sabatka soils are on hills and ridges. They are moderately deep over shale. The surface soil is clay loam about 3 inches thick. The subsoil is clay. The substratum is clay in the upper part and clayey shale in the lower part.

The moderately sloping to steep Ironbutte soils are on hills and ridges. They are very deep. The surface soil is channery loam about 4 inches thick. The substratum is very channery loam in the upper part and fractured porcelanite in the lower part.

This unit is used for livestock grazing and wildlife habitat. The production of vegetation suitable for livestock grazing is limited by low annual precipitation, low to very low available water capacity of the soils, and by the limited rooting depth of the Lismas and Ironbutte soils.

All of this unit provides summer habitat for antelope and mule deer. The Coal Creek watershed provides important antelope winter habitat. An area south of the Belle Fourche River along the eastern county line provides important mule deer winter habitat. Crucial winter habitat for elk occurs along the county line in the areas northeast of Bacon Creek and south of Little Thunder Creek. Numerous sage

grouse leks and golden eagle nests occur throughout the unit. The area of this map unit in the southeast corner of the survey area has a high density of golden eagle nests, prairie dog towns, and prairie falcon nests. This unit is also used by wintering bald eagles.

Included in this unit is habitat for species such as white-tailed and black-tailed jackrabbits, thirteen-lined ground squirrel, Ord's kangaroo rat, desert cottontail, coyote, red fox, badger, and birds common to shrub steppes, pastures, prairies, and ponderosa pine.

Soils on the Lowlands

Areas of dominantly very deep soils on alluvial fans, fan remnants, flood plains, and stream terraces

203—Clarkelen-Bidman Association

Nearly level and gently sloping, very deep, moderately coarse and fine textured soils on alluvial fans, fan remnants, flood plains, and stream terraces

This unit is about 40 percent Clarkelen and similar soils and 35 percent Bidman and similar soils. Slopes are 0 to 6 percent.

The nearly level Clarkelen soils are on flood plains and stream terraces. They are very deep. The surface soil is very fine sandy loam about 3 inches thick. The substratum is fine sandy loam stratified with sandy loam, very fine sandy loam, and loam in the upper part, and sandy loam stratified with loamy fine sand, fine sandy loam, and very fine sandy loam in the lower part. Clarkelen soils are subject to occasional flooding for very brief periods from April to June.

The nearly level and gently sloping Bidman soils are on alluvial fans, fan remnants, and stream terraces. They are very deep. The surface soil is loam about 2 inches thick. The subsoil is clay in the upper part and clay loam in the lower part.

This unit is used for livestock grazing and wildlife habitat. The production of vegetation suitable for livestock grazing is limited by low annual precipitation.

All of this unit provides summer habitat for antelope and mule deer. The area along Little Thunder Creek provides important winter habitat for antelope and nesting habitat for golden eagles.

Included in this unit is habitat for species such as water shrew, muskrat, beaver, raccoon, mink, white-tailed and black-tailed jackrabbits, thirteen-lined ground squirrel, Ord's kangaroo rat, desert cottontail, coyote, red fox, badger, and birds common to shrub steppes, wetland shrubs and trees, and those associated with water.

368—Haverdad-Kishona-Forkwood Association

Nearly level to moderately sloping, very deep, medium textured soils on alluvial fans, fan remnants, flood plains, and stream terraces

This unit is about 25 percent Haverdad and similar soils, 25 percent Kishona and similar soils, and 20 percent Forkwood and similar soils. Slopes are 0 to 10 percent.

The nearly level Haverdad soils are on flood plains and stream terraces. They are very deep. The surface soil is loam about 4 inches thick. The substratum is loam stratified with fine sandy loam, very fine sandy loam, sandy clay loam, and silt loam. Haverdad soils are subject to occasional flooding for very brief periods from April to June.

The gently sloping and moderately sloping Kishona soils are on alluvial fans, fan remnants, and stream terraces. They are very deep. The surface soil is loam about 4 inches thick. The subsoil is clay loam.

The nearly level to moderately sloping Forkwood soils are on alluvial fans and fan remnants. They are very deep. The surface soil is loam about 2 inches thick. The subsoil is clay loam in the upper part and loam in the lower part.

This unit is used for livestock grazing, hayland and pasture, and wildlife habitat. The production of vegetation suitable for livestock grazing is limited by low annual precipitation. If this unit is used for hayland and pasture, the main limitation is low annual precipitation.

All of this unit provides summer habitat for antelope and mule deer. The area of this map unit upstream from the confluence of the Belle Fourche River and Dry Creek provides important winter habitat for antelope and nesting habitat for golden eagles.

Included in this unit is habitat for species such as water shrew, muskrat, beaver, raccoon, mink, white-tailed and black-tailed jackrabbits, thirteen-lined ground squirrel, Ord's kangaroo rat, desert cottontail, coyote, red fox, badger, and birds common to shrub steppes, pastures, wetland shrubs and trees, and those associated with water.

Detailed Soil Map Units

The map units delineated on the detailed soil maps in Part III of this survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions in this section, along with the maps, can be used to determine the suitability and potential of a unit for specific uses. They also can be used to plan the management needed for those uses.

A map unit delineation on a map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some included areas that belong to other taxonomic classes.

Most included soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, inclusions. They may or may not be mentioned in the map unit description. Other included soils and miscellaneous areas, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, inclusions. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. The included areas of contrasting soils or miscellaneous areas are mentioned in the map unit descriptions. A few included areas may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of included areas in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives the principal hazards and limitations to be considered in planning for specific uses.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Arvada, thick surface, very fine sandy loam is a phase of the Arvada series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes or associations.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown

separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Forkwood-Cambria loams, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Haverdad-Kishona association, 0 to 6 percent slopes, is an example.

This survey includes *miscellaneous areas.* Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

The table "Acreage and Proportionate Extent of the Soils" in Parts I and II of the manuscript gives the acreage and proportionate extent of each map unit. Other tables (See "Summary of Tables") give properties of the soils and the limitations, capabilities, and potentials for many uses. The Glossary defines many of the terms used in describing the soils or miscellaneous areas.

100—Aridic Ustorthents, saline, 0 to 4 percent slopes

Setting

Elevation: 4,200 to 4,810 feet
Mean annual precipitation: 15 to 17 inches
Frost-free period: 105 to 130 days

Major Component Description

Aridic Ustorthents and similar soils

Composition: 85 percent
Landform: Stream terrace
Landform Element: None assigned
Slope: 0 to 4 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Parent Material: Alluvium derived from sandstone and shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Salt Affected: Saline within 6 inches
Sodium Affected: Not affected
Typical profile:
A—0 to 2 inches; loam
Bw—2 to 6 inches; clay loam
By—6 to 46 inches; stratified loam to clay loam
C—46 to 60 inches; stratified fine sandy loam to clay loam
Note: Permeability of Aridic Ustorthents, saline soils is moderately slow. Available water capacity is moderate. Runoff is low to medium. The hazard of water erosion is slight. The hazard of wind erosion is moderate.

Typical soil descriptions with range in characteristics are included, in alphabetical order, in the section Soil Series and Their Morphology.

Additional Components

Ziggy: 5 percent
Echeta: 4 percent
Areas of 6 to 15 percent slopes: 3 percent
Poorly drained saline soils: 3 percent

Use and Management

This unit is used primarily as rangeland and wildlife habitat.

This unit is moderately suited for stockwater ponds. The main limitation is the moderate potential for seepage losses and the saline soil. Due to the salinity of the soil, the water may not be suitable for livestock.

This unit is well suited for mechanical range renovation and moderately well suited for range seeding. The main limitations for range seeding are the salinity of the subsoil and the hazard of wind erosion. If range seeding is conducted, seeding rates may need to be increased and plant species carefully selected because of the salinity of the subsoil. To reduce the hazard of wind erosion, adequate residue must be maintained on the surface at all times until the seeding is established. Tilled areas must remain narrow and at right angles to the wind. The low annual precipitation should be considered when planning a seeding.

For general and detailed information about managing this map unit, see the following sections in Part II of this publication: Agronomy, Range, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

101—Arvada, thick surface very fine sandy loam, 0 to 6 percent slopes

Setting

Elevation: 4,100 to 5,000 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 105 to 130 days

Major Component Description

Arvada and similar soils

Composition: 85 percent
Landform: Alluvial fan, fan remnant
Landform Element: None assigned
Slope: 0 to 6 percent
Depth to Restrictive Feature: Natric: 15 inches
Drainage Class: Well drained
Parent Material: Alluvium derived from calcareous shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Salt Affected: Saline within 15 inches
Sodium Affected: Sodic within 15 inches
Typical profile:
E—0 to 7 inches; very fine sandy loam
Bt—7 to 15 inches; silty clay loam
Btkny—15 to 26 inches; silty clay
Bkny—26 to 60 inches; clay loam
Note: Permeability of the Arvada, thick surface soil is slow. Available water capacity is moderate. Effective rooting depth is 60 inches or more for salt-tolerant plants. Runoff is medium. The hazard of water erosion is slight. The hazard of wind erosion is severe.

Typical soil descriptions with range in characteristics are included, in alphabetical order, in the section Soil Series and Their Morphology.

Additional Components

Arvada fine sandy loam: 4 percent
Bidman: 4 percent
Keyner: 4 percent
Ulm: 3 percent

Use and Management

This unit is used as rangeland and wildlife habitat.

This unit is moderately suited for stockwater ponds. The main limitation is the moderate potential for seepage losses and the saline soil. Due to the salinity of the soil, the water may not be suitable for livestock.

This unit is moderately well suited for mechanical range renovation and range seeding. Mechanical range renovation may not be economically feasible due to the coarse texture of the surface layer. The main limitation for range seeding is the hazard of wind erosion. To reduce the hazard of wind erosion, adequate residue must be maintained on the surface at all times until the seeding is established. Tilled areas must remain narrow and at right angles to the wind. The low annual precipitation should be considered when planning a seeding.

For general and detailed information about managing this map unit, see the following sections in Part II of this publication: Agronomy, Range, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

102—Arvada, thick surface-Arvada-Slickspots complex, 0 to 6 percent slopes

Setting

Elevation: 4,100 to 5,000 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 105 to 130 days

Major Component Description

Arvada and similar soils

Composition: 40 percent
Landform: Alluvial fan, fan remnant
Landform Element: None assigned
Slope: 0 to 6 percent
Depth to Restrictive Feature: Natric: 15 inches
Drainage Class: Well drained
Parent Material: Alluvium derived from calcareous shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Salt Affected: Saline within 15 inches
Sodium Affected: Sodic within 15 inches
Typical profile:
E—0 to 7 inches; very fine sandy loam
Bt—7 to 15 inches; silty clay loam
Btkny—15 to 26 inches; silty clay
Bkny—26 to 60 inches; clay
Note: Permeability of the Arvada, thick surface soil is slow. Available water capacity is moderate. Effective rooting depth is 60 inches or more for salt-tolerant plants. Runoff is medium. The hazard of water erosion is slight. The hazard of wind erosion is severe.

Arvada and similar soils

Composition: 30 percent
Landform: Alluvial fan, fan remnant
Landform Element: None assigned
Slope: 0 to 6 percent
Depth to Restrictive Feature: Natric: 2 inches

Drainage Class: Well drained
Parent Material: Alluvium derived from calcareous shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Salt Affected: Saline within 2 inches
Sodium Affected: Sodic within 2 inches
Typical profile:
E—0 to 2 inches; fine sandy loam
Btn—2 to 9 inches; clay
Btkn—9 to 15 inches; clay
Bkny—15 to 60 inches; silty clay loam
Note: Permeability of the Arvada soil is slow. Available water capacity is high. Effective rooting depth is 60 inches or more for salt-tolerant plants. Runoff is medium. The hazard of water erosion is slight. The hazard of wind erosion is severe.

Slickspots

Composition: 10 percent
Landform: Alluvial fan, fan remnant
Landform Element: None assigned
Slope: —-
Depth to Restrictive Feature: None noted
Drainage Class: —-
Parent Material: Alluvium derived from shale
Flooding: —-
Water Table: No water table exists above a depth of 6 feet
Ponding: No seasonal ponding exists
Salt Affected: Saline throughout the soil profile
Sodium Affected: Sodic throughout the soil profile
Note: Slickspots are areas 2 to 10 feet in diameter that are generally barren of vegetation. They generally have a thin, very strongly alkaline, white loamy surface layer 1 to 2 inches thick. The subsoil and substratum are commonly clayey and very strongly alkaline. Runoff is very high.

Typical soil descriptions with range in characteristics are included, in alphabetical order, in the section Soil Series and Their Morphology.

Additional Components

Bidman: 5 percent
Felix, ponded: 5 percent
Keyner: 5 percent
Ulm: 5 percent

Use and Management

This unit is used as rangeland and wildlife habitat.

This unit is moderately suited for stockwater ponds. The main limitation is the moderate potential for seepage losses and the saline soil. Due to the salinity of the soil, the water may not be suitable for livestock.

This unit is moderately well suited for mechanical range renovation and range seeding. Mechanical range renovation may not be economically feasible due to the coarse texture of the surface layer and the salinity and alkalinity of the Arvada soil and the slickspots. The main limitations for range seeding are the hazard of wind erosion, the salinity and alkalinity of the Arvada soil, and the presence of slickspots. If range seeding is conducted, seeding rates may need to be increased and plant species carefully selected because of the salinity and alkalinity of the Arvada soil. The low annual precipitation should be considered when planning a seeding. The areas of slickspots in this unit support little or no vegetation due to characteristics that severely limit plant growth. Therefore, range seeding and range renovation will not be successful on these areas.

For general and detailed information about managing this map unit, see the following sections in Part II of this publication: Agronomy, Range, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

103—Arwite fine sandy loam, 0 to 6 percent slopes

Setting

Elevation: 4,300 to 4,800 feet
Mean annual precipitation: 15 to 17 inches
Frost-free period: 105 to 130 days

Major Component Description

Arwite and similar soils

Composition: 85 percent
Landform: Alluvial fan, fan remnant
Landform Element: None assigned
Slope: 0 to 6 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Parent Material: Alluvium and/or eolian deposits derived from sandstone and shale
Flooding: None

Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 5 inches; fine sandy loam
Bt—5 to 32 inches; sandy clay loam
Bk—32 to 60 inches; fine sandy loam
Note: Permeability of the Arwite soil is moderate. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is low. The hazard of water erosion is slight. The hazard of wind erosion is severe.

Typical soil descriptions with range in characteristics are included, in alphabetical order, in the section Soil Series and Their Morphology.

Additional Components

Deekay: 5 percent
Moskee: 5 percent
Rauzi: 3 percent
Vonalf: 2 percent

Use and Management

This unit is used as rangeland, nonirrigated hayland and pasture, nonirrigated cropland, and wildlife habitat. A few areas are also used for homesite and urban development.

This unit is poorly suited for stockwater ponds because of the high potential for seepage losses.

This unit is moderately well suited for mechanical range renovation and range seeding. The main limitation for range seeding is the hazard of wind erosion. Mechanical range renovation may not be economically feasible due to the coarse texture of the surface layer. To reduce the hazard of wind erosion, adequate residue must be maintained on the surface at all times until the seeding is established. Tilled areas must remain narrow and at right angles to the wind. The low annual precipitation should be considered when planning a seeding.

This unit is moderately well suited for nonirrigated hayland and pasture. The main limitation is low annual precipitation. Rotation grazing helps to maintain the quality of forage.

This unit is moderately well suited for nonirrigated cropland. The main limitations are low annual precipitation and the severe hazard of wind erosion. Because of the low annual precipitation, a crop rotation that most effectively uses soil moisture should be used. Reducing or eliminating tillage operations increases the effective use of soil moisture. Wind erosion can be reduced by planting crops in alternate strips and at right angles to the prevailing wind.

This unit is well suited for urban development. Revegetating disturbed areas around construction sites as soon as possible helps to control wind erosion.

For general and detailed information about managing this map unit, see the following sections in Part II of this publication: Agronomy, Range, Recreation, Wildlife Habitat, Engineering, and Soil Properties

104—Arwite fine sandy loam, 6 to 15 percent slopes

Setting

Elevation: 4,300 to 4,800 feet
Mean annual precipitation: 15 to 17 inches
Frost-free period: 105 to 130 days

Major Component Description

Arwite and similar soils

Composition: 80 percent
Landform: Hill, ridge
Landform Element: Backslope, footslope
Slope: 6 to 15 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Parent Material: Alluvium and/or eolian deposits derived from sandstone and shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 5 inches; fine sandy loam
Bt—5 to 32 inches; sandy clay loam
Bk—32 to 60 inches; fine sandy loam
Note: Permeability of the Arwite soil is moderate. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is low to medium. The hazard of water and wind erosion is severe.

Typical soil descriptions with range in characteristics are included, in alphabetical order, in the section Soil Series and Their Morphology.

Additional Components

Elwop: 6 percent
Moskee: 6 percent
Vonalf: 6 percent
Areas with 15-20 percent slope: 2 percent

Use and Management

This unit is used as rangeland and wildlife habitat.

This unit is poorly suited for stockwater ponds because of the high potential for seepage losses.

This unit is moderately well suited for mechanical range renovation and range seeding. The main limitation for range seeding is the hazard of water and wind erosion. Mechanical range renovation may not be economically feasible due to the coarse texture of the surface layer. To reduce the hazard of erosion, adequate residue must be maintained on the surface at all times until the seeding is established. Tilled areas must remain narrow and at right angles to the wind. The low annual precipitation should be considered when planning a seeding.

For general and detailed information about managing this map unit, see the following sections in Part II of this publication: Agronomy, Range, Recreation, Wildlife Habitat, Engineering, and Soil Properties

105—Arwite-Elwop fine sandy loams, 0 to 6 percent slopes

Setting

Elevation: 4,300 to 4,800 feet
Mean annual precipitation: 15 to 17 inches
Frost-free period: 105 to 130 days

Major Component Description

Arwite and similar soils

Composition: 50 percent
Landform: Hill, ridge
Landform Element: Backslope, footslope
Slope: 0 to 6 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Parent Material: Alluvium and/or eolian deposits derived from sandstone and shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 5 inches; fine sandy loam
Bt—5 to 32 inches; sandy clay loam
Bk—32 to 60 inches; fine sandy loam
Note: Permeability of the Arwite soil is moderate. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is low. The hazard of water erosion is slight. The hazard of wind erosion is severe.

Elwop and similar soils

Composition: 30 percent
Landform: Hill, ridge
Landform Element: Summit, shoulder
Slope: 0 to 6 percent
Depth to Restrictive Feature: Bedrock (paralithic): 20 to 40 inches
Drainage Class: Well drained
Parent Material: Alluvium and/or eolian deposits over residuum weathered from calcareous sandstone
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 4 inches; fine sandy loam
Bt—4 to 24 inches; sandy clay loam
Bk—24 to 35 inches; fine sandy loam
Cr—35 to 60 inches; bedrock
Note: Permeability of the Elwop soil is moderate. Available water capacity is moderate. Effective rooting depth is 20 to 40 inches. Runoff is low. The hazard of water erosion is slight. The hazard of wind erosion is severe.

Typical soil descriptions with range in characteristics are included, in alphabetical order, in the section Soil Series and Their Morphology.

Additional Components

Deekay: 4 percent
Oldwolf: 4 percent
Rauzi: 4 percent
Vonalf: 4 percent
Xema: 4 percent

Use and Management

This unit is used as rangeland, nonirrigated hayland and pasture, and wildlife habitat. A few areas are also used for homesite and urban development.

This unit is poorly suited for stockwater ponds because of the depth to bedrock within the Elwop soil

and the high potential of both soils for seepage losses.

This unit is moderately well suited for mechanical range renovation and range seeding. The main limitation is the hazard of wind erosion. Mechanical range renovation may not be economically feasible due to the coarse texture of the surface layer. To reduce the hazard of wind erosion, adequate residue must be maintained on the surface at all times until the seeding is established. Tilled areas must remain narrow and at right angles to the wind. The low annual precipitation should be considered when planning a seeding.

This unit is moderately well suited for nonirrigated hayland and pasture. The main limitation is low annual precipitation. Proper stocking rates, pasture rotation, and restricted grazing during wet periods help to keep the pasture in good condition and to protect these soils from excessive wind erosion.

The Arwite soil is well suited and the Elwop soil is moderately well suited for urban development. The main limitation is the depth to bedrock. Revegetating disturbed areas around construction sites as soon as possible helps to control wind erosion.

For general and detailed information about managing this map unit, see the following sections in Part II of this publication: Agronomy, Range, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

106—Arwite-Elwop fine sandy loams, 6 to 15 percent slopes

Setting

Elevation: 4,300 to 4,800 feet
Mean annual precipitation: 15 to 17 inches
Frost-free period: 105 to 130 days

Major Component Description

Arwite and similar soils

Composition: 45 percent
Landform: Hill, ridge
Landform Element: Backslope, footslope
Slope: 6 to 15 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Parent Material: Alluvium and/or eolian deposits derived from sandstone and shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 5 inches; fine sandy loam
Bt—5 to 32 inches; sandy clay loam
Bk—32 to 60 inches; fine sandy loam
Note: Permeability of the Arwite soil is moderate. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is medium. The hazard of water and wind erosion is severe.

Elwop and similar soils

Composition: 35 percent
Landform: Hill, ridge
Landform Element: Summit, shoulder
Slope: 6 to 15 percent
Depth to Restrictive Feature: Bedrock (paralithic): 20 to 40 inches
Drainage Class: Well drained
Parent Material: Alluvium and/or eolian deposits over residuum weathered from calcareous sandstone
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 4 inches; fine sandy loam
Bt—4 to 24 inches; sandy clay loam
Bk—24 to 35 inches; fine sandy loam
Cr—35 to 60 inches; bedrock
Note: Permeability of the Elwop soil is moderate. Available water capacity is moderate. Effective rooting depth is 20 to 40 inches. Runoff is medium. The hazard of water and wind erosion is severe.

Typical soil descriptions with range in characteristics are included, in alphabetical order, in the section Soil Series and Their Morphology.

Additional Components

Oldwolf: 5 percent
Rauzi: 5 percent
Vonalf: 5 percent
Xema: 5 percent

Use and Management

This unit is used as rangeland and wildlife habitat.

This unit is poorly suited for stockwater ponds because of the depth to bedrock within the Elwop soil

and the high potential of both soils for seepage losses.

This unit is moderately well suited for mechanical range renovation and range seeding. The main limitation for range seeding is the hazard of water and wind erosion. Mechanical range renovation may not be economically feasible due to the coarse texture of the surface layer. To reduce the hazard of erosion, adequate residue must be maintained on the surface at all times until the seeding is established. Tilled areas must remain narrow and at right angles to the wind. The low annual precipitation should be considered when planning a seeding.

For general and detailed information about managing this map unit, see the following sections in Part II of this publication: Agronomy, Range, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

107—Arwite-Vonalf fine sandy loams, 0 to 6 percent slopes

Setting

Elevation: 4,300 to 4,800 feet
Mean annual precipitation: 15 to 17 inches
Frost-free period: 105 to 130 days

Major Component Description

Arwite and similar soils

Composition: 45 percent
Landform: Alluvial fan, hill
Landform Element: Footslope
Slope: 0 to 6 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Parent Material: Alluvium and/or eolian deposits derived from sandstone and shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 5 inches; fine sandy loam
Bt—5 to 32 inches; sandy clay loam
Bk—32 to 60 inches; fine sandy loam
Note: Permeability of the Arwite soil is moderate. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is low. The hazard of water erosion is slight. The hazard of wind erosion is severe.

Vonalf and similar soils

Composition: 35 percent
Landform: Alluvial fan, hill
Landform Element: Footslope
Slope: 0 to 6 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Parent Material: Alluvium and/or eolian deposits derived from calcareous sandstone
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 6 inches; fine sandy loam
Bt—6 to 34 inches; fine sandy loam
Bk—34 to 60 inches; fine sandy loam
Note: Permeability of the Vonalf soil is moderately rapid. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is very low. The hazard of water erosion is slight. The hazard of wind erosion is severe.

Typical soil descriptions with range in characteristics are included, in alphabetical order, in the section Soil Series and Their Morphology.

Additional Components

Elwop: 8 percent
Xema: 5 percent
Areas with 6-10 percent slopes: 2 percent

Use and Management

This unit is used as rangeland, nonirrigated hayland and pasture, and wildlife habitat.

This unit is poorly suited for stockwater ponds because of the high potential for seepage losses.

This unit is poorly suited for mechanical range renovation and range seeding. The main limitation is the hazard of wind erosion. Mechanical range renovation may not be economically feasible due to the coarse texture of the surface layer. To reduce the hazard of wind erosion, adequate residue must be maintained on the surface at all times until the seeding is established. Tilled areas must remain narrow and at right angles to the wind. The low annual precipitation should be considered when planning a seeding.

This unit is moderately well suited for nonirrigated hayland and pasture. The main limitation is low annual precipitation. Rotation grazing and proper hayland management help to maintain the quality of forage.

For general and detailed information about managing this map unit, see the following sections in Part II of this publication: Agronomy, Range, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

108—Arwite-Vonalf fine sandy loams, 6 to 15 percent slopes

Setting

Elevation: 4,300 to 4,800 feet
Mean annual precipitation: 15 to 17 inches
Frost-free period: 105 to 130 days

Major Component Description

Arwite and similar soils

Composition: 45 percent
Landform: Hill, ridge
Landform Element: Backslope, footslope
Slope: 6 to 15 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Parent Material: Alluvium and/or eolian deposits derived from sandstone and shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 5 inches; fine sandy loam
Bt—5 to 32 inches; sandy clay loam
Bk—32 to 60 inches; fine sandy loam
Note: Permeability of the Arwite soil is moderate. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is medium. The hazard of water and wind erosion is severe.

Vonalf and similar soils

Composition: 40 percent
Landform: Hill, ridge
Landform Element: Backslope, footslope
Slope: 6 to 15 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Parent Material: Alluvium and/or eolian deposits derived from calcareous sandstone
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 6 inches; fine sandy loam
Bt—6 to 34 inches; fine sandy loam
Bk—34 to 60 inches; fine sandy loam
Note: Permeability of the Vonalf soil is moderately rapid. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is low. The hazard of water and wind erosion is severe.

Typical soil descriptions with range in characteristics are included, in alphabetical order, in the section Soil Series and Their Morphology.

Additional Components

Elwop: 8 percent
Xema: 5 percent
Areas with 3-6 Percent Slopes: 2 percent

Use and Management

This unit is used as rangeland and wildlife habitat.

This unit is poorly suited for stockwater ponds because of the high potential for seepage losses.

This unit is moderately well suited for mechanical range renovation and range seeding. The main limitation for range seeding is the hazard of water and wind erosion. Mechanical range renovation may not be economically feasible due to the coarse texture of the surface layer. To reduce the hazard of erosion, adequate residue must be maintained on the surface at all times until the seeding is established. Tilled areas must remain narrow and at right angles to the wind. The low annual precipitation should be considered when planning a seeding.

For general and detailed information about managing this map unit, see the following sections in Part II of this publication: Agronomy, Range, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

109—Bidman loam, 0 to 6 percent slopes

Setting

Elevation: 4,100 to 5,200 feet

Mean annual precipitation: 10 to 14 inches
Frost-free period: 105 to 130 days

Major Component Description

Bidman and similar soils

Composition: 80 percent
Landform: Alluvial fan, fan remnant
Landform Element: None assigned
Slope: 0 to 6 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Parent Material: Alluvium derived from calcareous shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
E—0 to 2 inches; loam
Bt—2 to 28 inches; clay
Bk—28 to 60 inches; clay loam
Note: Permeability of the Bidman soil is slow. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is low to medium. The hazard of water erosion is slight. The hazard of wind erosion is moderate.

Typical soil descriptions with range in characteristics are included, in alphabetical order, in the section Soil Series and Their Morphology.

Additional Components

Forkwood: 6 percent
Ulm: 6 percent
Areas with 6 to 10 percent slopes: 5 percent
Felix, ponded: 3 percent

Use and Management

This unit is used as rangeland, nonirrigated hayland and pasture, and wildlife habitat.

This unit is moderately well suited for stockwater ponds. The main limitation is the moderate potential for seepage losses.

This unit is well suited for mechanical range renovation and range seeding. To reduce the hazard of wind erosion, adequate residue must be maintained on the surface at all times until the seeding is established. Tilled areas must remain narrow and at right angles to the wind. The low annual precipitation should be considered when planning a seeding.

This unit is moderately well suited for nonirrigated hayland and pasture. The main limitation is low annual precipitation. Proper stocking rates, pasture rotation, and restricted grazing during wet periods help to keep the pasture in good condition and to protect the soil from excessive water and wind erosion.

For general and detailed information about managing this map unit, see the following sections in Part II of this publication: Agronomy, Range, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

110—Bidman loam, loamy substratum, 0 to 6 percent slopes

Setting

Elevation: 4,100 to 5,200 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 105 to 130 days

Major Component Description

Bidman and similar soils

Composition: 80 percent
Landform: Alluvial fan, fan remnant
Landform Element: None assigned
Slope: 0 to 6 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Parent Material: Alluvium derived from calcareous shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
E—0 to 4 inches; loam
Bt—4 to 25 inches; clay
Bk—25 to 52 inches; clay loam
2C—52 to 60 inches; sandy clay loam
Note: Permeability of the Bidman, loamy substratum soil is slow. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is low to medium. The hazard of water erosion is slight. The hazard of wind erosion is moderate.

Typical soil descriptions with range in characteristics are included, in alphabetical order, in the section Soil Series and Their Morphology.

Additional Components

Bidman, loam: 8 percent
Ulm: 6 percent
Forkwood: 4 percent
Felix, ponded: 2 percent

Use and Management

This unit is used as rangeland and wildlife habitat.

This unit is moderately well suited for stockwater ponds. The main limitation is the moderate potential for seepage losses.

This unit is well suited for mechanical range renovation and range seeding. The main limitation for range seeding is the hazard of wind erosion. To reduce the hazard of wind erosion, adequate residue must be maintained on the surface at all times until the seeding is established. Tilled areas must remain narrow and at right angles to the wind. The low annual precipitation should be considered when planning a seeding.

For general and detailed information about managing this map unit, see the following sections in Part II of this publication: Agronomy, Range, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

111—Bidman-Parmleed loams, 0 to 6 percent slopes

Setting

Elevation: 4,100 to 5,200 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 105 to 130 days

Major Component Description

Bidman and similar soils

Composition: 50 percent
Landform: Hill, ridge
Landform Element: Backslope, footslope
Slope: 0 to 6 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Parent Material: Alluvium derived from calcareous shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
E—0 to 2 inches; loam
Bt—2 to 28 inches; clay
Bk—28 to 60 inches; clay loam
Note: Permeability of the Bidman soil is slow. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is low to medium. The hazard of water erosion is slight. The hazard of wind erosion is moderate.

Parmleed and similar soils

Composition: 30 percent
Landform: Hill, ridge
Landform Element: Summit, shoulder
Slope: 0 to 6 percent
Depth to Restrictive Feature: Bedrock (paralithic): 20 to 40 inches
Drainage Class: Well drained
Parent Material: Alluvium over residuum weathered from calcareous shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
E—0 to 3 inches; loam
Bt—3 to 21 inches; clay
Bk—21 to 27 inches; clay loam
Cr—27 to 60 inches; bedrock
Note: Permeability of the Parmleed soils is slow. Available water capacity is low. Effective rooting depth is 20 to 40 inches. Runoff is low to medium. The hazard of water erosion is slight. The hazard of wind erosion is moderate.

Typical soil descriptions with range in characteristics are included, in alphabetical order, in the section Soil Series and Their Morphology.

Additional Components

Forkwood: 6 percent
Ulm: 6 percent
Cushman: 4 percent
Felix, ponded: 4 percent

Use and Management

This unit is used as rangeland, nonirrigated hayland and pasture, and wildlife habitat.

The Bidman soil is moderately well suited for stockwater ponds. The main limitation is the moderate potential for seepage losses. The Parmleed soil is poorly suited for stockwater ponds due to the depth to bedrock.

This unit is well suited for mechanical range renovation and range seeding. The main limitation for range seeding is the hazard of wind erosion. To reduce the hazard of wind erosion, adequate residue must be maintained on the surface at all times until the seeding is established. Tilled areas must remain narrow and at right angles to the wind. The low annual precipitation should be considered when planning a seeding.

This unit is moderately well suited for nonirrigated hayland and pasture. The main limitation is low annual precipitation. Proper stocking rates, pasture rotation, and restricted grazing during wet periods help to keep the pasture in good condition and to protect these soils from excessive water and wind erosion.

For general and detailed information about managing this map unit, see the following sections in Part II of this publication: Agronomy, Range, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

112—Bidman-Parmleed loams, 6 to 15 percent slopes

Setting

Elevation: 4,100 to 5,200 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 105 to 130 days

Major Component Description

Bidman and similar soils

Composition: 45 percent
Landform: Hill, ridge
Landform Element: Backslope, footslope
Slope: 6 to 10 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Parent Material: Alluvium derived from calcareous shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
E—0 to 2 inches; loam
Bt—2 to 28 inches; clay
Bk—28 to 60 inches; clay loam
Note: Permeability of the Bidman soil is slow. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is high. The hazard of water erosion is severe. The hazard of wind erosion is moderate.

Parmleed and similar soils

Composition: 40 percent
Landform: Hill, ridge
Landform Element: Summit, shoulder
Slope: 6 to 15 percent
Depth to Restrictive Feature: Bedrock (paralithic): 20 to 40 inches
Drainage Class: Well drained
Parent Material: Alluvium over residuum weathered from calcareous shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
E—0 to 3 inches; loam
Bt—3 to 21 inches; clay
Bk—21 to 27 inches; clay loam
Cr—27 to 60 inches; bedrock
Note: Permeability of the Parmleed soils is slow. Available water capacity is low. Effective rooting depth is 20 to 40 inches. Runoff is high. The hazard of water erosion is severe. The hazard of wind erosion is moderate.

Typical soil descriptions with range in characteristics are included, in alphabetical order, in the section Soil Series and Their Morphology.

Additional Components

Cushman: 5 percent
Forkwood: 5 percent
Worfka: 5 percent

Use and Management

This unit is used as rangeland and wildlife habitat.

The Bidman soil is moderately well suited for stockwater ponds. The main limitation is the moderate potential for seepage losses. The Parmleed soil is poorly suited for stockwater ponds due to the depth to bedrock.

This unit is well suited for mechanical range renovation and moderately well suited for range seeding. The main limitations for range seeding are slope and the hazard of water erosion. To reduce the hazard of erosion, adequate residue must be maintained on the surface at all times until the seeding is established. If practical, renovation and

tillage for seeding should be along the contour of the slope. The low annual precipitation should be considered when planning a seeding.

For general and detailed information about managing this map unit, see the following sections in Part II of this publication: Agronomy, Range, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

113—Bidman-Ulm loams, 0 to 6 percent slopes

Setting

Elevation: 4,100 to 5,200 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 105 to 130 days

Major Component Description

Bidman and similar soils

Composition: 40 percent
Landform: Alluvial fan, fan remnant
Landform Element: None assigned
Slope: 0 to 6 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Parent Material: Alluvium derived from calcareous shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
E—0 to 7 inches; loam
Bt—7 to 36 inches; clay loam
Bk—36 to 60 inches; clay loam
Note: Permeability of the Bidman soil is slow. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is medium. The hazard of water erosion is slight. The hazard of wind erosion is moderate.

Ulm and similar soils

Composition: 40 percent
Landform: Alluvial fan, fan remnant
Landform Element: None assigned
Slope: 0 to 6 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Parent Material: Alluvium derived from calcareous shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 4 inches; loam
Bt—4 to 30 inches; clay loam
Bk—30 to 60 inches; clay loam
Note: Permeability of the Ulm soil is slow. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is medium. The hazard of water and wind erosion is moderate.

Typical soil descriptions with range in characteristics are included, in alphabetical order, in the section Soil Series and Their Morphology.

Additional Components

Forkwood: 7 percent
Parmleed: 5 percent
Renohill: 5 percent
Felix, ponded: 3 percent

Use and Management

This unit is used as rangeland, nonirrigated hayland and pasture, and wildlife habitat.

The Bidman soil is moderately well suited for stockwater ponds. The main limitation is the moderate potential for seepage losses. The Ulm soil is well suited for stockwater ponds.

This unit is well suited for mechanical range renovation and range seeding. To reduce the hazard of wind erosion, adequate residue must be maintained on the surface at all times until the seeding is established. Tilled areas must remain narrow and at right angles to the wind. The low annual precipitation should be considered when planning a seeding.

This unit is moderately well suited for nonirrigated hayland and pasture. The main limitation is low annual precipitation. Proper stocking rates, pasture rotation, and restricted grazing during wet periods help to keep the pasture in good condition and to protect these soils from excessive water and wind erosion.

For general and detailed information about managing this map unit, see the following sections in Part II of this publication: Agronomy, Range, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

114—Bowbac-Taluce-Badland complex, 3 to 20 percent slopes

Setting

Elevation: 4,400 to 5,000 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 105 to 130 days

Major Component Description

Bowbac and similar soils

Composition: 40 percent
Landform: Hill, ridge
Landform Element: Summit, shoulder
Slope: 3 to 15 percent
Depth to Restrictive Feature: Bedrock (paralithic): 20 to 40 inches
Drainage Class: Well drained
Parent Material: Alluvium and/or eolian deposits over residuum weathered from calcareous sandstone
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 3 inches; sandy loam
Bt—3 to 31 inches; sandy clay loam
Bk—31 to 39 inches; sandy loam
Cr—39 to 60 inches; bedrock
Note: Permeability of the Bowbac soil is moderate. Available water capacity is moderate. Effective rooting depth is 20 to 40 inches. Runoff is low. The hazard of water erosion is moderate. The hazard of wind erosion is severe.

Taluce and similar soils

Composition: 30 percent
Landform: Hill, ridge
Landform Element: Summit, shoulder
Slope: 3 to 20 percent
Depth to Restrictive Feature: Bedrock (paralithic): 10 to 20 inches
Drainage Class: Somewhat excessively drained
Parent Material: Residuum weathered from calcareous sandstone
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 2 inches; sandy loam
C—2 to 14 inches; sandy loam
Cr—14 to 60 inches; bedrock
Note: Permeability of the Taluce soil is moderately rapid. Available water capacity is very low. Effective rooting depth is 10 to 20 inches. Runoff is very high. The hazard of water and wind erosion is severe.

Badland

Composition: 15 percent
Landform: Hill, ridge
Landform Element: Summit, shoulder
Slope: —
Depth to Restrictive Feature: Bedrock (paralithic): 0 to 0 inches
Drainage Class: —
Parent Material: Residuum weathered from sandstone and shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Note: Badland consists of exposures of sandstone and sandy shale.

Typical soil descriptions with range in characteristics are included, in alphabetical order, in the section Soil Series and Their Morphology.

Additional Components

Terro: 5 percent
Turnercrest: 5 percent
Vonalee: 5 percent

Use and Management

This unit is used as rangeland and wildlife habitat.

This unit is poorly suited for stockwater ponds, mechanical range renovation, and range seeding. The main limitations are depth to bedrock, steepness of slope, and the hazard of water and wind erosion. The presence of areas of badland is also a limitation.

For general and detailed information about managing this map unit, see the following sections in Part II of this publication: Agronomy, Range, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

115—Bowbac-Worf fine sandy loams, 3 to 15 percent slopes

Setting

Elevation: 4,100 to 6,000 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 105 to 130 days

Major Component Description

Bowbac and similar soils

Composition: 50 percent
Landform: Butte, hill, ridge
Landform Element: Summit, shoulder
Slope: 3 to 15 percent
Depth to Restrictive Feature: Bedrock (paralithic): 20 to 40 inches
Drainage Class: Well drained
Parent Material: Alluvium and/or eolian deposits over residuum weathered from calcareous sandstone
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 3 inches; fine sandy loam
Bt—3 to 31 inches; sandy clay loam
Bk—31 to 39 inches; sandy loam
Cr—39 to 60 inches; bedrock
Note: Permeability of the Bowbac soil is moderate. Available water capacity is moderate. Effective rooting depth is 20 to 40 inches. Runoff is low. The hazard of water erosion is moderate. The hazard of wind erosion is severe.

Worf and similar soils

Composition: 30 percent
Landform: Hill, ridge
Landform Element: Summit, shoulder
Slope: 3 to 15 percent
Depth to Restrictive Feature: Bedrock (paralithic): 10 to 20 inches
Drainage Class: Well drained
Parent Material: Residuum weathered from sandstone and shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 1 inches; fine sandy loam
Bt—1 to 12 inches; sandy clay loam
Bk—12 to 18 inches; sandy clay loam
Cr—18 to 60 inches; bedrock
Note: Permeability of the Worf soil is moderate. Available water capacity is very low. Effective rooting depth is 10 to 20 inches. Runoff is very high. The hazard of water erosion is moderate. The hazard of wind erosion is severe.

Typical soil descriptions with range in characteristics are included, in alphabetical order, in the section Soil Series and Their Morphology.

Additional Components

Hiland: 5 percent
Shingle: 5 percent
Taluce: 5 percent
Theedle: 5 percent

Use and Management

This unit is used as rangeland and wildlife habitat.

This unit is poorly suited for stockwater ponds. The main limitations are depth to bedrock and steepness of slope.

The Bowbac soil is moderately well suited for mechanical range renovation and range seeding. The main limitation for range seeding is the hazard of water and wind erosion. Mechanical range renovation may not be economically feasible due to the coarse texture of the surface layer. The Worf soil is poorly suited for mechanical range renovation. Mechanical range renovation may not be economically feasible due to the low potential to increase the amount of forage. The Worf soil is moderately suited for range seeding. The main limitations are the hazard of water and wind erosion and the droughtiness of the soil. To reduce the hazard of wind erosion, adequate residue must be maintained on the surface at all times until the seeding is established. Tilled areas must remain narrow and at right angles to the wind. The low annual precipitation should be considered when planning a seeding.

For general and detailed information about managing this map unit, see the following sections in Part II of this publication: Agronomy, Range, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

116—Cambria-Kishona-Zigweid loams, 0 to 6 percent slopes

Setting

Elevation: 4,100 to 5,200 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 105 to 130 days

Major Component Description

Cambria and similar soils

Composition: 40 percent
Landform: Alluvial fan, fan remnant
Landform Element: None assigned
Slope: 0 to 6 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Parent Material: Alluvium derived from sandstone and shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 2 inches; loam
Bt—2 to 10 inches; clay loam
Bk—10 to 60 inches; clay loam
Note: Permeability of the Cambria soil is moderate. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is low. The hazard of water erosion is slight. The hazard of wind erosion is moderate.

Kishona and similar soils

Composition: 30 percent
Landform: Alluvial fan, fan remnant
Landform Element: None assigned
Slope: 0 to 6 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Parent Material: Alluvium derived from sandstone and shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 2 inches; loam
Bk—2 to 60 inches; loam
Note: Permeability of the Kishona soil is moderate. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is low. The hazard of water erosion is slight. The hazard of wind erosion is moderate.

Zigweid and similar soils

Composition: 15 percent
Landform: Alluvial fan, fan remnant
Landform Element: None assigned
Slope: 0 to 6 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Parent Material: Alluvium derived from sandstone and shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 2 inches; loam
Bw—2 to 13 inches; clay loam
Bk—13 to 60 inches; clay loam
Note: Permeability of the Zigweid soil is moderate. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is low. The hazard of water erosion is slight. The hazard of wind erosion is moderate.

Typical soil descriptions with range in characteristics are included, in alphabetical order, in the section Soil Series and Their Morphology.

Additional Components

Cushman: 5 percent
Forkwood: 4 percent
Ulm: 4 percent
Poorly drained soils: 2 percent

Use and Management

This unit is used primarily as rangeland and wildlife habitat.

This unit is moderately well suited for stockwater ponds. The main limitation is the moderate potential for seepage losses.

This unit is well suited for mechanical range renovation and range seeding. To reduce the hazard of wind erosion, adequate residue must be maintained on the surface at all times until the seeding is established. Tilled areas must remain narrow and at right angles to the wind. The low annual precipitation should be considered when planning a seeding.

For general and detailed information about managing this map unit, see the following sections in Part II of this publication: Agronomy, Range, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

117—Cambria-Kishona-Zigweid loams, 6 to 15 percent slopes

Setting

Elevation: 4,100 to 5,200 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 105 to 130 days

Major Component Description

Cambria and similar soils

Composition: 35 percent
Landform: Hill, ridge
Landform Element: Backslope, footslope
Slope: 6 to 15 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Parent Material: Alluvium derived from sandstone and shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 3 inches; loam
Bt—3 to 12 inches; clay loam
Bk—12 to 60 inches; clay loam
Note: Permeability of the Cambria soil is moderate. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is medium. The hazard of water erosion is severe. The hazard of wind erosion is moderate.

Kishona and similar soils

Composition: 30 percent
Landform: Hill, ridge
Landform Element: Backslope, footslope
Slope: 6 to 15 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Parent Material: Alluvium derived from sandstone and shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 2 inches; loam
Bk—2 to 60 inches; loam
Note: Permeability of the Kishona soil is moderate. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is medium. The hazard of water erosion is severe. The hazard of wind erosion is moderate.

Zigweid and similar soils

Composition: 20 percent
Landform: Hill, ridge
Landform Element: Backslope, footslope
Slope: 6 to 15 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Parent Material: Alluvium derived from sandstone and shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 2 inches; loam
Bw—2 to 13 inches; clay loam
Bk—13 to 60 inches; clay loam
Note: Permeability of the Zigweid soil is moderate. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is medium. The hazard of water erosion is severe. The hazard of wind erosion is moderate.

Typical soil descriptions with range in characteristics are included, in alphabetical order, in the section Soil Series and Their Morphology.

Additional Components

Cushman: 5 percent
Forkwood: 5 percent
Theedle: 5 percent

Use and Management

This unit is used as rangeland and wildlife habitat.

This unit is moderately well suited for stockwater ponds. The main limitations are slope and the moderate potential for seepage losses.

This unit is well suited for mechanical range renovation and moderately well suited for range

seeding. The main limitation for range seeding is the hazard of erosion. To reduce the hazard of erosion, adequate residue must be maintained on the surface at all times until the seeding is established. If practical, renovation and tillage for seeding should be along the contour of the slope. The low annual precipitation should be considered when planning a seeding.

For general and detailed information about managing this map unit, see the following sections in Part II of this publication: Agronomy, Range, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

118—Clarkelen-Draknab complex, 0 to 3 percent slopes

Setting

Elevation: 4,100 to 5,000 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 105 to 130 days

Major Component Description

Clarkelen and similar soils

Composition: 60 percent
Landform: Flood plain, stream terrace
Landform Element: None assigned
Slope: 0 to 3 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Parent Material: Alluvium derived from sandstone and shale
Flooding: Occasional
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 3 inches; very fine sandy loam
C—3 to 60 inches; stratified loamy fine sand to loam
Note: Permeability of the Clarkelen soil is moderately rapid. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is very low. The hazard of water erosion is slight. The hazard of wind erosion is severe. This soil is subject to rare to occasional flooding for very brief periods during prolonged, high intensity storms from April through July.

Draknab and similar soils

Composition: 25 percent
Landform: Flood plain, stream terrace
Landform Element: None assigned
Slope: 0 to 3 percent
Depth to Restrictive Feature: None noted
Drainage Class: Excessively drained
Parent Material: Alluvium derived from sandstone and shale
Flooding: Occasional
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 4 inches; sandy loam
C1—4 to 28 inches; stratified loamy sand to fine sandy loam
C2—28 to 60 inches; stratified sand to sandy loam
Note: Permeability of the Draknab soil is moderately rapid. Available water capacity is moderate. Effective rooting depth is 60 inches or more. Runoff is very low. The hazard of water erosion is slight. The hazard of wind erosion is severe. This soil is subject to rare to occasional flooding for very brief periods during prolonged, high intensity storms from April through July.

Typical soil descriptions with range in characteristics are included, in alphabetical order, in the section Soil Series and Their Morphology.

Additional Components

Boruff: 5 percent
Haverdad: 5 percent
Kishona: 5 percent

Use and Management

This unit is used primarily as rangeland and wildlife habitat.

This unit is poorly suited for stockwater ponds. The main limitation is the high potential for seepage losses.

This unit is moderately well suited for mechanical range renovation and range seeding. The main limitation for range seeding is the hazard of wind erosion. Mechanical range renovation may not be economically feasible due to the coarse texture of the surface layer. To reduce the hazard of wind erosion,

adequate residue must be maintained on the surface at all times until the seeding is established. Tilled areas must remain narrow and at right angles to the wind. The low annual precipitation should be considered when planning a seeding.

For general and detailed information about managing this map unit, see the following sections in Part II of this publication: Agronomy, Range, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

119—Clarkelen-Embry fine sandy loams, 0 to 4 percent slopes

Setting

Elevation: 4,100 to 4,800 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 105 to 130 days

Major Component Description

Clarkelen and similar soils

Composition: 55 percent
Landform: Flood plain, stream terrace
Landform Element: None assigned
Slope: 0 to 3 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Parent Material: Alluvium derived from sandstone and shale
Flooding: Occasional
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 3 inches; fine sandy loam
C—3 to 60 inches; stratified loamy fine sand to loam
Note: Permeability of the Clarkelen soil is moderately rapid. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is very low. The hazard of water erosion is slight. The hazard of wind erosion is severe. This soil is subject to rare to occasional flooding for very brief periods during prolonged, high intensity storms from April through July.

Embry and similar soils

Composition: 25 percent
Landform: Stream terrace
Landform Element: None assigned
Slope: 0 to 4 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Parent Material: Alluvium and/or eolian deposits derived from sandstone
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 3 inches; fine sandy loam
C—3 to 60 inches; sandy loam
Note: Permeability of the Embry soil is moderately rapid. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is low. The hazard of water erosion is slight. The hazard of wind erosion is severe.

Typical soil descriptions with range in characteristics are included, in alphabetical order, in the section Soil Series and Their Morphology.

Additional Components

Gravelly loamy soils: 8 percent
Loamy soils: 8 percent
Poorly drained soils: 4 percent

Use and Management

This unit is used as rangeland and wildlife habitat.

This unit is poorly suited for stockwater ponds. The main limitation is the high potential for seepage losses.

This unit is moderately well suited for mechanical range renovation and range seeding. The main limitation for range seeding is the hazard of wind erosion. Mechanical range renovation may not be economically feasible due to the coarse texture of the surface layer. To reduce the hazard of wind erosion, adequate residue must be maintained on the surface at all times until the seeding is established. Tilled areas must remain narrow and at right angles to the wind. The low annual precipitation should be considered when planning a seeding.

For general and detailed information about managing this map unit, see the following sections in Part II of this publication: Agronomy, Range, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

120—Clarkelen-Keeline association, 0 to 6 percent slopes

Setting

Elevation: 4,100 to 5,000 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 105 to 130 days

Major Component Description

Clarkelen and similar soils

Composition: 60 percent
Landform: Flood plain, stream terrace
Landform Element: None assigned
Slope: 0 to 3 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Parent Material: Alluvium derived from sandstone and shale
Flooding: Occasional
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 3 inches; very fine sandy loam
C—3 to 60 inches; stratified loamy fine sand to loam
Note: Permeability of the Clarkelen soil is moderately rapid. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is very low. The hazard of water erosion is slight. The hazard of wind erosion is severe. This soil is subject to rare to occasional flooding for very brief periods during prolonged, high intensity storms from April through June.

Keeline and similar soils

Composition: 25 percent
Landform: Stream terrace
Landform Element: None assigned
Slope: 0 to 6 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Parent Material: Alluvium and/or eolian deposits derived from calcareous sandstone
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 4 inches; sandy loam
C—4 to 60 inches; sandy loam
Note: Permeability of the Keeline soil is moderately rapid. Available water capacity is moderate. Effective rooting depth is 60 inches or more. Runoff is very low. The hazard of water erosion is slight. The hazard of wind erosion is severe.

Typical soil descriptions with range in characteristics are included, in alphabetical order, in the section Soil Series and Their Morphology.

Additional Components

Haverdad: 8 percent
Boruff: 7 percent

Use and Management

This unit is used as rangeland and wildlife habitat.

This unit is poorly suited for stockwater ponds. The main limitation is the high potential for seepage losses.

This unit is moderately well suited for mechanical range renovation and range seeding. The main limitation for range seeding is the hazard of wind erosion. Mechanical range renovation may not be economically feasible due to the coarse texture of the surface layer. To reduce the hazard of wind erosion, adequate residue must be maintained on the surface at all times until the seeding is established. Tilled areas must remain narrow and at right angles to the wind. The low annual precipitation should be considered when planning a seeding.

For general and detailed information about managing this map unit, see the following sections in Part II of this publication: Agronomy, Range, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

121—Cushman-Cambria loams, 0 to 6 percent slopes

Setting

Elevation: 4,100 to 5,200 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 105 to 130 days

Major Component Description

Cushman and similar soils

Composition: 40 percent
Landform: Hill, ridge
Landform Element: Summit, shoulder
Slope: 0 to 6 percent
Depth to Restrictive Feature: Bedrock (paralithic): 20 to 40 inches
Drainage Class: Well drained
Parent Material: Alluvium over residuum weathered from sandstone and shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 2 inches; loam
Bt—2 to 19 inches; clay loam
Bk—19 to 31 inches; loam
Cr—31 to 60 inches; bedrock
Note: Permeability of the Cushman soil is moderate. Available water capacity is moderate. Effective rooting depth is 20 to 40 inches. Runoff is low. The hazard of water erosion is slight. The hazard of wind erosion is moderate.

Cambria and similar soils

Composition: 35 percent
Landform: Hill, ridge
Landform Element: Backslope, footslope
Slope: 0 to 6 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Parent Material: Alluvium derived from sandstone and shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 2 inches; loam
Bt—2 to 12 inches; clay loam
Bk—12 to 60 inches; loam
Note: Permeability of the Cambria soil is moderate. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is low. The hazard of water erosion is slight. The hazard of wind erosion is moderate.

Typical soil descriptions with range in characteristics are included, in alphabetical order, in the section Soil Series and Their Morphology.

Additional Components

Bowbac: 5 percent
Forkwood: 5 percent
Hiland: 5 percent
Kishona: 5 percent

Use and Management

This unit is used primarily as rangeland and wildlife habitat.

The Cushman soil is poorly suited for stockwater ponds. The main limitation is depth to bedrock. The Cambria soil is moderately well suited for stockwater ponds. The main limitation is the moderate potential for seepage losses.

This unit is well suited for mechanical range renovation and range seeding. To reduce the hazard of wind erosion, adequate residue must be maintained on the surface at all times until the seeding is established. Tilled areas must remain narrow and at right angles to the wind. The low annual precipitation should be considered when planning a seeding.

For general and detailed information about managing this map unit, see the following sections in Part II of this publication: Agronomy, Range, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

122—Cushman-Cambria loams, 6 to 15 percent slopes

Setting

Elevation: 4,100 to 5,200 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 105 to 130 days

Major Component Description

Cushman and similar soils

Composition: 50 percent
Landform: Hill, ridge
Landform Element: Summit, shoulder
Slope: 6 to 15 percent

Depth to Restrictive Feature: Bedrock (paralithic): 20 to 40 inches
Drainage Class: Well drained
Parent Material: Alluvium over residuum weathered from sandstone and shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 2 inches; loam
Bt—2 to 23 inches; clay loam
Bk—23 to 30 inches; loam
Cr—30 to 60 inches; bedrock
Note: Permeability of the Cushman soil is moderate. Available water capacity is moderate. Effective rooting depth is 20 to 40 inches. Runoff is medium. The hazard of water erosion is severe. The hazard of wind erosion is moderate.

Cambria and similar soils

Composition: 30 percent
Landform: Hill, ridge
Landform Element: Backslope, footslope
Slope: 6 to 15 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Parent Material: Alluvium derived from sandstone and shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 2 inches; loam
Bt—2 to 12 inches; clay loam
Bk—12 to 60 inches; loam
Note: Permeability of the Cambria soil is moderate. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is medium. The hazard of water erosion is severe. The hazard of wind erosion is moderate.

Typical soil descriptions with range in characteristics are included, in alphabetical order, in the section Soil Series and Their Morphology.

Additional Components

Bowbac: 5 percent
Forkwood: 5 percent
Worf: 5 percent
Zigweid: 5 percent

Use and Management

This unit is used as rangeland and wildlife habitat.

The Cushman soil is poorly suited for stockwater ponds. The main limitation is depth to bedrock. The Cambria soil is moderately well suited for stockwater ponds. The main limitations are slope and the moderate potential for seepage losses.

This unit is well suited for mechanical range renovation and moderately well suited for range seeding. The main limitation is the hazard of water erosion. To reduce the hazard of erosion, adequate residue must be maintained on the surface at all times until the seeding is established. If practical, renovation and tillage for seeding should be along the contour of the slope. The low annual precipitation should be considered when planning a seeding.

For general and detailed information about managing this map unit, see the following sections in Part II of this publication: Agronomy, Range, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

123—Cushman-Renohill loams, 6 to 15 percent slopes

Setting

Elevation: 4,100 to 5,200 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 105 to 130 days

Major Component Description

Cushman and similar soils

Composition: 40 percent
Landform: Hill, ridge
Landform Element: Summit, shoulder
Slope: 6 to 15 percent
Depth to Restrictive Feature: Bedrock (paralithic): 20 to 40 inches
Drainage Class: Well drained
Parent Material: Alluvium over residuum weathered from sandstone and shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 3 inches; loam
Bt—3 to 13 inches; clay loam
Bk—13 to 25 inches; loam
Cr—25 to 60 inches; bedrock

Note: Permeability of the Cushman soil is moderate. Available water capacity is low. Effective rooting depth is 20 to 40 inches. Runoff is medium. The hazard of water erosion is severe. The hazard of wind erosion is moderate.

Renohill and similar soils

Composition: 40 percent
Landform: Hill, ridge
Landform Element: Summit, shoulder
Slope: 6 to 15 percent
Depth to Restrictive Feature: Bedrock (paralithic): 20 to 40 inches
Drainage Class: Well drained
Parent Material: Alluvium over residuum weathered from calcareous shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 2 inches; loam
Bt—2 to 14 inches; clay
Bk—14 to 26 inches; clay loam
Cr—26 to 60 inches; bedrock
Note: Permeability of the Renohill soil is slow. Available water capacity is low. Effective rooting depth is 20 to 40 inches. Runoff is high. The hazard of water erosion is severe. The hazard of wind erosion is moderate.

Typical soil descriptions with range in characteristics are included, in alphabetical order, in the section Soil Series and Their Morphology.

Additional Components

Forkwood: 5 percent
Ulm: 5 percent
Shingle: 4 percent
Areas with 3-6 percent slopes: 3 percent
Worfka: 3 percent

Use and Management

This unit is used as rangeland and wildlife habitat.

This unit is poorly suited for stockwater ponds. The main limitation is depth to bedrock.

This unit is well suited for mechanical range renovation and moderately well suited for range seeding. The main limitation for range seeding is the hazard of water erosion. To reduce the hazard of erosion, adequate residue must be maintained on the surface at all times until the seeding is established. If practical, renovation and tillage for seeding should be along the contour of the slope. The low annual precipitation should be considered when planning a seeding.

For general and detailed information about managing this map unit, see the following sections in Part II of this publication: Agronomy, Range, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

124—Cushman-Shingle loams, 6 to 15 percent slopes

Setting

Elevation: 4,100 to 5,400 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 105 to 130 days

Major Component Description

Cushman and similar soils

Composition: 55 percent
Landform: Hill, ridge
Landform Element: Summit, shoulder
Slope: 6 to 15 percent
Depth to Restrictive Feature: Bedrock (paralithic): 20 to 40 inches
Drainage Class: Well drained
Parent Material: Alluvium over residuum weathered from sandstone and shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 3 inches; loam
Bt—3 to 13 inches; clay loam
Bk—13 to 25 inches; loam
Cr—25 to 60 inches; bedrock
Note: Permeability of the Cushman soil is moderate. Available water capacity is low. Effective rooting depth is 20 to 40 inches. Runoff is medium. The hazard of water erosion is severe. The hazard of wind erosion is moderate.

Shingle and similar soils

Composition: 25 percent
Landform: Hill, ridge
Landform Element: Summit, shoulder
Slope: 6 to 15 percent

Depth to Restrictive Feature: Bedrock (paralithic): 10 to 20 inches
Drainage Class: Well drained
Parent Material: Residuum weathered from sandstone and shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 1 inches; loam
C—1 to 12 inches; loam
Cr—12 to 60 inches; bedrock
Note: Permeability of the Shingle soil is moderate. Available water capacity is very low. Effective rooting depth is 10 to 20 inches. Runoff is very high. The hazard of water erosion is severe. The hazard of wind erosion is moderate.

Typical soil descriptions with range in characteristics are included, in alphabetical order, in the section Soil Series and Their Morphology.

Additional Components

Theedle: 5 percent
Worf: 4 percent
Areas of 3 to 6 percent slopes: 3 percent
Cambria: 3 percent
Renohill: 3 percent
Samday: 2 percent

Use and Management

This unit is used as rangeland and wildlife habitat. Occasional coniferous trees occur on this unit in some areas in the Rochelle Hills.

This unit is poorly suited for stockwater ponds. The main limitation is depth to bedrock.

The Cushman soil is well suited for mechanical range renovation and range seeding. The main limitation for range seeding is the hazard of water and wind erosion. The Shingle soil is poorly suited for mechanical range renovation and moderately well suited for range seeding. The main limitation for range seeding is the hazard of water erosion. Mechanical range renovation on the Shingle soil may not be economically feasible due to low potential to increase the amount of forage. To reduce the hazard of wind erosion, adequate residue must be maintained on the surface at all times until the seeding is established. If practical, renovation and tillage for seeding should be along the contour of the slope. The low annual precipitation should be considered when planning a seeding.

For general and detailed information about managing this map unit, see the following sections in Part II of this publication: Agronomy, Range, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

125—Cushman-Terro complex, 6 to 15 percent slopes

Setting

Elevation: 4,100 to 5,000 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 105 to 130 days

Major Component Description

Cushman and similar soils

Composition: 50 percent
Landform: Hill, ridge
Landform Element: Summit, shoulder
Slope: 6 to 15 percent
Depth to Restrictive Feature: Bedrock (paralithic): 20 to 40 inches
Drainage Class: Well drained
Parent Material: Alluvium over residuum weathered from sandstone and shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 3 inches; loam
Bt—3 to 13 inches; clay loam
Bk—13 to 25 inches; loam
Cr—25 to 60 inches; bedrock
Note: Permeability of the Cushman soil is moderate. Available water capacity is low. Effective rooting depth is 20 to 40 inches. Runoff is medium. The hazard of water erosion is severe. The hazard of wind erosion is moderate.

Terro and similar soils

Composition: 30 percent
Landform: Hill, ridge
Landform Element: Summit, shoulder

Slope: 6 to 15 percent
Depth to Restrictive Feature: Bedrock (paralithic): 20 to 40 inches
Drainage Class: Well drained
Parent Material: Alluvium over residuum weathered from calcareous sandstone
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 3 inches; sandy loam
Bt—3 to 16 inches; sandy loam
Bk—16 to 23 inches; sandy loam
Cr—23 to 60 inches; bedrock
Note: Permeability of the Terro soil is moderately rapid. Available water capacity is very low. Effective rooting depth is 20 to 40 inches. Runoff is low. The hazard of water and wind erosion is severe.

Typical soil descriptions with range in characteristics are included, in alphabetical order, in the section Soil Series and Their Morphology.

Additional Components

Bowbac: 5 percent
Hiland: 5 percent
Shingle: 5 percent
Taluce: 5 percent

Use and Management

This unit is used as rangeland and wildlife habitat.

This unit is poorly suited for stockwater ponds. The main limitation is depth to bedrock.

This unit is moderately well suited for range seeding. The main limitation for range seeding is the hazard of water and wind erosion. To reduce the hazard of erosion, adequate residue must be maintained on the surface at all times until the seeding is established. Tilled areas must remain narrow and at right angles to the wind. The low annual precipitation should be considered when planning a seeding. The Cushman soil is well suited and the Terro soil is moderately well suited for mechanical range renovation. Mechanical range renovation may not be economically feasible on the Terro soil due to the coarse texture of the surface layer.

For general and detailed information about managing this map unit, see the following sections in Part II of this publication: Agronomy, Range, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

126—Cushman-Theedle loams, 0 to 6 percent slopes

Setting

Elevation: 4,100 to 5,200 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 105 to 130 days

Major Component Description

Cushman and similar soils

Composition: 40 percent
Landform: Hill, ridge
Landform Element: Summit, shoulder
Slope: 0 to 6 percent
Depth to Restrictive Feature: Bedrock (paralithic): 20 to 40 inches
Drainage Class: Well drained
Parent Material: Alluvium over residuum weathered from sandstone and shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 2 inches; loam
Bt—2 to 23 inches; clay loam
Bk—23 to 30 inches; loam
Cr—30 to 60 inches; bedrock
Note: Permeability of the Cushman soil is moderate. Available water capacity is low. Effective rooting depth is 20 to 40 inches. Runoff is low. The hazard of water erosion is slight. The hazard of wind erosion is moderate.

Theedle and similar soils

Composition: 40 percent
Landform: Hill, ridge
Landform Element: Summit, shoulder
Slope: 0 to 6 percent
Depth to Restrictive Feature: Bedrock (paralithic): 20 to 40 inches
Drainage Class: Well drained
Parent Material: Alluvium over residuum weathered from sandstone and shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet

Ponding: None
Typical profile:
A—0 to 2 inches; loam
Bk—2 to 28 inches; clay loam
Cr—28 to 60 inches; bedrock
Note: Permeability of the Theedle soil is moderate. Available water capacity is moderate. Effective rooting depth is 20 to 40 inches. Runoff is low to medium. The hazard of water erosion is slight. The hazard of wind erosion is moderate.

Typical soil descriptions with range in characteristics are included, in alphabetical order, in the section Soil Series and Their Morphology.

Additional Components

Cambria: 5 percent
Kishona: 5 percent
Renohill: 4 percent
Shingle: 4 percent
Areas with 6-10 percent slopes: 2 percent

Use and Management

This unit is used as rangeland and wildlife habitat.

This unit is poorly suited for stockwater ponds. The main limitation is depth to bedrock.

This unit is well suited for mechanical range renovation and range seeding. Adequate residue must be maintained on the surface at all times until the seeding is established. Tilled areas must remain narrow and at right angles to the wind. The low annual precipitation should be considered when planning a seeding.

For general and detailed information about managing this map unit, see the following sections in Part II of this publication: Agronomy, Range, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

127—Cushman-Theedle loams, 6 to 15 percent slopes

Setting

Elevation: 4,100 to 5,200 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 105 to 130 days

Major Component Description

Cushman and similar soils

Composition: 50 percent
Landform: Hill, ridge
Landform Element: Summit, shoulder
Slope: 6 to 15 percent
Depth to Restrictive Feature: Bedrock (paralithic): 20 to 40 inches
Drainage Class: Well drained
Parent Material: Alluvium over residuum weathered from sandstone and shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 3 inches; loam
Bt—3 to 13 inches; clay loam
Bk—13 to 25 inches; loam
Cr—25 to 60 inches; bedrock
Note: Permeability of the Cushman soil is moderate. Available water capacity is low. Effective rooting depth is 20 to 40 inches. Runoff is medium. The hazard of water erosion is severe. The hazard of wind erosion is moderate.

Theedle and similar soils

Composition: 30 percent
Landform: Hill, ridge
Landform Element: Summit, shoulder
Slope: 6 to 15 percent
Depth to Restrictive Feature: Bedrock (paralithic): 20 to 40 inches
Drainage Class: Well drained
Parent Material: Alluvium over residuum weathered from sandstone and shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 2 inches; loam
Bk—2 to 28 inches; clay loam
Cr—28 to 60 inches; bedrock
Note: Permeability of the Theedle soil is moderate. Available water capacity is low. Effective rooting depth is 20 to 40 inches. Runoff is high. The hazard of water erosion is

severe. The hazard of wind erosion is moderate.

Typical soil descriptions with range in characteristics are included, in alphabetical order, in the section Soil Series and Their Morphology.

Additional Components

Kishona: 7 percent
Shingle: 7 percent
Cambria: 6 percent

Use and Management

This unit is used as rangeland and wildlife habitat.

This unit is poorly suited for stockwater ponds. The main limitation is depth to bedrock.

This unit is well suited for mechanical range renovation and moderately well suited for range seeding. The main limitation is the hazard of water and wind erosion. To reduce the hazard of wind erosion, adequate residue must be maintained on the surface at all times until the seeding is established. If practical, renovation and tillage for seeding should be along the contour of the slope. The low annual precipitation should be considered when planning a seeding.

For general and detailed information about managing this map unit, see the following sections in Part II of this publication: Agronomy, Range, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

128—Cushman-Worf loams, 3 to 15 percent slopes

Setting

Elevation: 4,100 to 5,200 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 105 to 130 days

Major Component Description

Cushman and similar soils

Composition: 50 percent
Landform: Butte, hill, ridge
Landform Element: Summit, shoulder
Slope: 3 to 15 percent
Depth to Restrictive Feature: Bedrock (paralithic): 20 to 40 inches
Drainage Class: Well drained
Parent Material: Alluvium over residuum weathered from sandstone and shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 5 inches; loam
Bt—5 to 25 inches; loam
Bk—25 to 35 inches; clay loam
Cr—35 to 60 inches; bedrock
Note: Permeability of the Cushman soil is moderate. Available water capacity is moderate. Effective rooting depth is 20 to 40 inches. Runoff is low. The hazard of water erosion is severe. The hazard of wind erosion is moderate.

Worf and similar soils

Composition: 30 percent
Landform: Hill, ridge
Landform Element: Summit, shoulder
Slope: 3 to 15 percent
Depth to Restrictive Feature: Bedrock (paralithic): 10 to 20 inches
Drainage Class: Well drained
Parent Material: Residuum weathered from sandstone and shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 2 inches; loam
Bt—2 to 10 inches; loam
Bk—10 to 18 inches; loam
Cr—18 to 60 inches; bedrock
Note: Permeability of the Worf soil is moderate. Available water capacity is very low. Effective rooting depth is 20 to 40 inches. Runoff is medium to rapid. The hazard of water erosion is severe. The hazard of wind erosion is moderate.

Typical soil descriptions with range in characteristics are included, in alphabetical order, in the section Soil Series and Their Morphology.

Additional Components

Renohill: 4 percent
Theedle: 4 percent
Vonalee: 4 percent
Taluce: 3 percent
Worfka: 3 percent
Areas with 0-3 percent slopes: 2 percent

Use and Management

This unit is used as rangeland and wildlife habitat. Occasional coniferous trees occur in some areas in the Rochelle Hills.

This unit is poorly suited for stockwater ponds. The main limitation is depth to bedrock.

The Cushman soil is well suited for mechanical range renovation and moderately well suited for range seeding. The main limitation for range seeding is the hazard of water erosion. The Worf soil is poorly suited for mechanical range renovation and moderately well suited for range seeding. The main limitations for range seeding are the hazard of water erosion and the doughtiness of the soil. Mechanical range renovation may not be economically feasible due to low potential to increase the amount of forage. To reduce the hazard of erosion, adequate residue must be maintained on the surface at all times until the seeding is established. If practical, renovation and tillage for seeding should be along the contour of the slope. The low annual precipitation should be considered when planning a seeding.

For general and detailed information about managing this map unit, see the following sections in Part II of this publication: Agronomy, Range, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

129—Decolney-Hiland fine sandy loams, 0 to 6 percent slopes

Setting

Elevation: 4,100 to 5,200 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 105 to 130 days

Major Component Description

Decolney and similar soils

Composition: 50 percent
Landform: Alluvial fan, fan remnant
Landform Element: None assigned
Slope: 0 to 6 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Parent Material: Alluvium and/or eolian deposits derived from sandstone and shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 3 inches; fine sandy loam
Bt—3 to 22 inches; sandy clay loam
C1—22 to 43 inches; sandy loam
C2—43 to 60 inches; sandy loam
Note: Permeability of the Decolney soil is moderate. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is low. The hazard of water erosion is slight. The hazard of wind erosion is severe.

Hiland and similar soils

Composition: 35 percent
Landform: Alluvial fan, fan remnant
Landform Element: None assigned
Slope: 0 to 6 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Parent Material: Alluvium and/or eolian deposits derived from sandstone and shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 4 inches; fine sandy loam
Bt—4 to 15 inches; sandy clay loam
Bk—15 to 60 inches; sandy loam
Note: Permeability of the Hiland soil is moderate. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is low. The hazard of water erosion is slight. The hazard of wind erosion is severe.

Typical soil descriptions with range in characteristics are included, in alphabetical order, in the section Soil Series and Their Morphology.

Additional Components

Vonalee: 9 percent
Bowbac: 6 percent

Use and Management

This unit is used as rangeland, nonirrigated hayland and pasture, and wildlife habitat.

This unit is poorly suited for stockwater ponds. The main limitation is the high potential for seepage losses.

This unit is moderately well suited for mechanical range renovation and range seeding. The main limitation for range seeding is the hazard of wind erosion. Mechanical range renovation may not be economically feasible due to the coarse texture of the surface layer. To reduce the hazard of wind erosion, adequate residue must be maintained on the surface at all times until the seeding is established. Tilled areas must remain narrow and at right angles to the wind. The low annual precipitation should be considered when planning a seeding.

This unit is moderately well suited for nonirrigated hayland and pasture. The main limitation is low annual precipitation. Hayland management practices and proper grazing use helps to maintain the quality of forage.

For general and detailed information about managing this map unit, see the following sections in Part II of this publication: Agronomy, Range, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

130—Decolney-Hiland fine sandy loams, 6 to 15 percent slopes

Setting

Elevation: 4,100 to 5,200 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 105 to 130 days

Major Component Description

Decolney and similar soils

Composition: 50 percent
Landform: Hill, ridge
Landform Element: Backslope, footslope
Slope: 6 to 15 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Parent Material: Alluvium and/or eolian deposits derived from sandstone and shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 3 inches; fine sandy loam
Bt—3 to 22 inches; sandy clay loam
C1—22 to 43 inches; sandy loam
C2—43 to 60 inches; sandy loam
Note: Permeability of the Decolney soil is moderate. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is medium. The hazard of water and wind erosion is severe.

Hiland and similar soils

Composition: 30 percent
Landform: Hill, ridge
Landform Element: Backslope, footslope
Slope: 6 to 15 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Parent Material: Alluvium and/or eolian deposits derived from sandstone and shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 3 inches; fine sandy loam
Bt—3 to 32 inches; sandy clay loam
Bk—32 to 60 inches; sandy loam
Note: Permeability of the Hiland soil is moderate. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is medium. The hazard of water and wind erosion is severe.

Typical soil descriptions with range in characteristics are included, in alphabetical order, in the section Soil Series and Their Morphology.

Additional Components

Bowbac: 7 percent
Moskee: 6 percent
Vonalee: 5 percent
Areas with 15-20 percent slope: 2 percent

Use and Management

This unit is used as rangeland and wildlife habitat.

This unit is poorly suited for stockwater ponds. The main limitation is the high potential for seepage losses.

This unit is moderately well suited for mechanical range renovation and range seeding. The main limitation for range seeding is the hazard of water and wind erosion. Mechanical range renovation may not be economically feasible due to the coarse texture of the surface layer. To reduce the hazard of erosion, adequate residue must be maintained on the surface at all times until the seeding is established. Tilled areas must remain narrow and at right angles to the wind. The low annual precipitation should be considered when planning a seeding.

For general and detailed information about managing this map unit, see the following sections in Part II of this publication: Agronomy, Range, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

131—Deekay loam, 0 to 6 percent slopes

Setting

Elevation: 4,300 to 4,800 feet
Mean annual precipitation: 15 to 17 inches
Frost-free period: 105 to 130 days

Major Component Description

Deekay and similar soils

Composition: 80 percent
Landform: Alluvial fan, fan remnant
Landform Element: None assigned
Slope: 0 to 6 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Parent Material: Alluvium derived from sandstone and shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 4 inches; loam
Bt—4 to 23 inches; clay loam
Bk—23 to 60 inches; loam
Note: Permeability of the Deekay soil is moderate. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is low. The hazard of water erosion is slight. The hazard of wind erosion is moderate.

Typical soil descriptions with range in characteristics are included, in alphabetical order, in the section Soil Series and Their Morphology.

Additional Components

Moorhead: 7 percent
Oshoto: 7 percent
Ziggy: 6 percent

Use and Management

This unit is used as rangeland, nonirrigated hayland and pasture, nonirrigated cropland, and wildlife habitat (fig. 3). A few areas are also used for homesite and urban development.

This unit is moderately well suited for stockwater ponds. The main limitation is the moderate potential for seepage losses.

This unit is well suited for mechanical range renovation and range seeding. Adequate residue must be maintained on the surface at all times until the seeding is established. Tilled areas must remain narrow and at right angles to the wind. The low annual precipitation should be considered when planning a seeding.

This unit is moderately well suited for nonirrigated hayland and pasture. The main limitation is low annual precipitation. Rotation grazing maintains optimum vigor and quality of forage.

This unit is moderately well suited for nonirrigated cropland. The main limitations are low annual precipitation and the hazard of wind erosion. Because of the low annual precipitation, a crop rotation that most effectively uses soil moisture should be used. Reducing or eliminating tillage operations increases the effective use of soil moisture. Wind erosion can be reduced by planting crops in alternate strips and at right angles to the prevailing wind. Crop residue left on or near the surface helps to conserve moisture, maintain tilth, and control water and wind erosion.

This unit is moderately well suited for urban development. The main limitations are the moderate shrink-swell potential and low strength of the soil. The effects of shrinking and swelling can be minimized by using proper engineering designs and by backfilling with material that has low shrink-swell potential. Buildings and roads should be designed to offset the limited ability of this soil to support a load.

For general and detailed information about managing this map unit, see the following sections in Part II of this publication: Agronomy, Range, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

Figure 3. The foreground is a typical area of Deekay loam, 0 to 6 percent slopes, on hills. The background is a typical area of Ironbutte-Fairburn-Mittenbutte complex, 6 to 40 percent slopes.

132—Deekay-Moorhead loams, 0 to 6 percent slopes

Setting

Elevation: 4,300 to 4,800 feet
Mean annual precipitation: 15 to 17 inches
Frost-free period: 105 to 130 days

Major Component Description

Deekay and similar soils

Composition: 50 percent
Landform: Alluvial fan, fan remnant
Landform Element: None assigned
Slope: 0 to 6 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Parent Material: Alluvium derived from sandstone and shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 4 inches; loam
Bt—4 to 24 inches; clay loam
Bk—24 to 60 inches; loam
Note: Permeability of the Deekay soil is moderate. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is low. The hazard of water erosion is slight. The hazard of wind erosion is moderate.

Moorhead and similar soils

Composition: 35 percent
Landform: Alluvial fan, fan remnant
Landform Element: None assigned
Slope: 0 to 6 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Parent Material: Alluvium derived from calcareous shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 5 inches; loam
Bt—5 to 35 inches; clay
Bk—35 to 60 inches; clay loam
Note: Permeability of the Moorhead soil is slow. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is medium. The hazard of water erosion is slight. The hazard of wind erosion is moderate.

Typical soil descriptions with range in characteristics are included, in alphabetical order, in the section Soil Series and Their Morphology.

Additional Components

Jaywest: 5 percent
Oshoto: 5 percent
Recluse: 5 percent

Use and Management

This unit is used as rangeland, nonirrigated hayland and pasture, nonirrigated cropland, and wildlife habitat. A few areas are also used for homesite and urban development.

The Deekay soil is moderately well suited for stockwater ponds. The main limitation is the moderate potential for seepage losses. The Moorhead soil is well suited for stockwater ponds.

This unit is well suited for mechanical range renovation and range seeding. Adequate residue must be maintained on the surface at all times until the seeding is established. Tilled areas must remain narrow and at right angles to the wind. The low annual precipitation should be considered when planning a seeding.

This unit is moderately well suited for nonirrigated hayland and pasture. The main limitation is low annual precipitation. Rotation grazing maintains optimum vigor and quality of forage.

This unit is moderately well suited for nonirrigated cropland. The main limitations are low annual precipitation and hazard of wind erosion. Because of the low annual precipitation, a crop rotation that most effectively uses soil moisture should be used. Reducing or eliminating tillage operations increases the effective use of soil moisture. Wind erosion can be reduced by planting crops in alternate strips at right angles to the prevailing wind. Crop residue left on or near the surface helps to conserve moisture, maintain tilth, and control water and wind erosion.

This unit is moderately well suited for urban development. The main limitations are the moderate shrink-swell potential and low strength of the soils. The effects of shrinking and swelling can be minimized by using proper engineering designs and by backfilling with material that has low shrink-swell potential. Buildings and roads should be designed to offset the limited ability of these soils to support a load.

For general and detailed information about managing this map unit, see the following sections in Part II of this publication: Agronomy, Range, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

133—Deekay-Moorhead loams, 6 to 15 percent slopes

Setting

Elevation: 4,300 to 4,800 feet
Mean annual precipitation: 15 to 17 inches
Frost-free period: 105 to 130 days

Major Component Description

Deekay and similar soils

Composition: 45 percent
Landform: Hill, ridge
Landform Element: Backslope, footslope
Slope: 6 to 15 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Parent Material: Alluvium derived from sandstone and shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 4 inches; loam
Bt—4 to 24 inches; clay loam
Bk—24 to 60 inches; loam
Note: Permeability of the Deekay soil is moderate. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is medium. The hazard of water erosion is severe. The hazard of wind erosion is moderate.

Moorhead and similar soils

Composition: 40 percent
Landform: Hill, ridge
Landform Element: Backslope, footslope
Slope: 6 to 15 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Parent Material: Alluvium derived from calcareous shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet

Ponding: None
Typical profile:
A—0 to 5 inches; loam
Bt—5 to 35 inches; clay
Bk—35 to 60 inches; clay loam
Note: Permeability of the Moorhead soil is slow. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is high. The hazard of water erosion is severe. The hazard of wind erosion is moderate.

Typical soil descriptions with range in characteristics are included, in alphabetical order, in the section Soil Series and Their Morphology.

Additional Components

Leiter: 5 percent
Oldwolf: 5 percent
Ziggy: 5 percent

Use and Management

This unit is used primarily as rangeland and wildlife habitat.

This unit is moderately well suited for stockwater ponds. The main limitations are slope and the moderate potential for seepage losses.

This unit is well suited for mechanical range renovation and moderately well suited for range seeding. The main limitation is the hazard of water erosion. To reduce the hazard of erosion, adequate residue must be maintained on the surface at all times until the seeding is established. If practical, renovation and tillage for seeding should be along the contour of the slope. The low annual precipitation should be considered when planning a seeding.

For general and detailed information about managing this map unit, see the following sections in Part II of this publication: Agronomy, Range, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

134—Deekay-Oldwolf loams, 0 to 6 percent slopes

Setting

Elevation: 4,300 to 4,800 feet
Mean annual precipitation: 15 to 17 inches
Frost-free period: 105 to 130 days

Major Component Description

Deekay and similar soils

Composition: 50 percent
Landform: Hill, ridge
Landform Element: Backslope, footslope
Slope: 0 to 6 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Parent Material: Alluvium derived from sandstone and shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 4 inches; loam
Bt—4 to 24 inches; clay loam
Bk—24 to 60 inches; loam
Note: Permeability of the Deekay soil is moderate. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is low. The hazard of water erosion is slight. The hazard of wind erosion is moderate.

Oldwolf and similar soils

Composition: 30 percent
Landform: Hill, ridge
Landform Element: Summit, shoulder
Slope: 0 to 6 percent
Depth to Restrictive Feature: Bedrock (paralithic): 20 to 40 inches
Drainage Class: Well drained
Parent Material: Alluvium over residuum weathered from sandstone and shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 3 inches; loam
Bt—3 to 21 inches; clay loam
Bk—21 to 32 inches; loam
Cr—32 to 60 inches; bedrock
Note: Permeability of the Oldwolf soil is moderate. Available water capacity is moderate. Effective rooting depth is 20 to 40 inches. Runoff is low. The hazard of water erosion is slight. The hazard of wind erosion is moderate.

Typical soil descriptions with range in characteristics are included, in alphabetical order, in the section Soil Series and Their Morphology.

Additional Components

Arwite: 5 percent
Recluse: 5 percent
Ucross: 5 percent
Ziggy: 5 percent

Use and Management

This unit is used as rangeland, nonirrigated hayland and pasture, and wildlife habitat.

The Deekay soil is moderately well suited for stockwater ponds. The main limitation is the moderate potential for seepage losses. The Oldwolf soil is poorly suited for stockwater ponds. The main limitation is the depth to bedrock.

This unit is well suited for mechanical range renovation and range seeding. Adequate residue must be maintained on the surface at all times until the seeding is established. Tilled areas must remain narrow and at right angles to the wind. The low annual precipitation should be considered when planning a seeding.

This unit is moderately well suited for nonirrigated hayland and pasture. The main limitation is low annual precipitation. Rotation grazing maintains optimum vigor and quality of forage.

For general and detailed information about managing this map unit, see the following sections in Part II of this publication: Agronomy, Range, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

135—Deekay-Oldwolf loams, 6 to 15 percent slopes

Setting

Elevation: 4,300 to 4,800 feet
Mean annual precipitation: 15 to 17 inches
Frost-free period: 105 to 130 days

Major Component Description

Deekay and similar soils

Composition: 50 percent
Landform: Hill, ridge
Landform Element: Backslope, footslope
Slope: 6 to 15 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Parent Material: Alluvium derived from sandstone and shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 4 inches; loam
Bt—4 to 24 inches; clay loam
Bk—24 to 60 inches; loam
Note: Permeability of the Deekay soil is moderate. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is medium. The hazard of water erosion is severe. The hazard of wind erosion is moderate.

Oldwolf and similar soils

Composition: 30 percent
Landform: Hill, ridge
Landform Element: Summit, shoulder
Slope: 6 to 15 percent
Depth to Restrictive Feature: Bedrock (paralithic): 20 to 40 inches
Drainage Class: Well drained
Parent Material: Alluvium over residuum weathered from sandstone and shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 3 inches; loam
Bt—3 to 21 inches; clay loam
Bk—21 to 32 inches; loam
Cr—32 to 60 inches; bedrock
Note: Permeability of the Oldwolf soil is moderate. Available water capacity is moderate. Effective rooting depth is 20 to 40 inches. Runoff is medium. The hazard of water erosion is severe. The hazard of wind erosion is moderate.

Typical soil descriptions with range in characteristics are included, in alphabetical order, in the section Soil Series and Their Morphology.

Additional Components

Moorhead: 5 percent
Recluse: 5 percent
Ucross: 5 percent
Ziggy: 5 percent

Use and Management

This unit is used primarily as rangeland and wildlife habitat.

The Deekay soil is moderately well suited for stockwater ponds. The main limitations are slope and the moderate potential for seepage losses. The Oldwolf soil is poorly suited for stockwater ponds. The main limitation is depth to bedrock.

This unit is well suited for mechanical range renovation and moderately well suited for range seeding. The main limitation for range seeding is the hazard of water erosion. To reduce the hazard of erosion, adequate residue must be maintained on the surface at all times until the seeding is established. If practical, renovation and tillage for seeding should be along the contour of the slope. The low annual precipitation should be considered when planning a seeding.

For general and detailed information about managing this map unit, see the following sections in Part II of this publication: Agronomy, Range, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

136—Deekay-Ziggy loams, 0 to 6 percent slopes

Setting

Elevation: 4,300 to 4,800 feet
Mean annual precipitation: 15 to 17 inches
Frost-free period: 105 to 130 days

Major Component Description

Deekay and similar soils

Composition: 50 percent
Landform: Alluvial fan, fan remnant
Landform Element: None assigned
Slope: 0 to 6 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Parent Material: Alluvium derived from sandstone and shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 4 inches; loam
Bt—4 to 24 inches; clay loam
Bk—24 to 60 inches; loam
Note: Permeability of the Deekay soil is moderate. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is low. The hazard of water erosion is slight. The hazard of wind erosion is moderate.

Ziggy and similar soils

Composition: 30 percent
Landform: Alluvial fan, fan remnant
Landform Element: None assigned
Slope: 0 to 6 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Parent Material: Alluvium derived from sandstone and shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 5 inches; loam
Bw—5 to 14 inches; loam
Bk—14 to 60 inches; clay loam
Note: Permeability of the Ziggy soil is moderate. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is low. The hazard of water erosion is slight. The hazard of wind erosion is moderate.

Typical soil descriptions with range in characteristics are included, in alphabetical order, in the section Soil Series and Their Morphology.

Additional Components

Moorhead: 6 percent
Oldwolf: 6 percent
Oshoto: 6 percent
Areas with 6-10 percent slopes: 2 percent

Use and Management

This unit is used primarily as rangeland, nonirrigated hayland and pasture, and wildlife habitat.

This unit is moderately well suited for stockwater ponds. The main limitation is the moderate potential for seepage losses.

This unit is well suited for mechanical range renovation and range seeding. Adequate residue must be maintained on the surface at all times until the seeding is established. Tilled areas must remain narrow and at right angles to the wind. The low annual precipitation should be considered when planning a seeding.

This unit is moderately well suited for nonirrigated hayland and pasture. The main limitation is low annual precipitation. Proper stocking rates and pasture rotation help to keep the pasture in good condition and to protect these soils from excessive wind erosion.

For general and detailed information about managing this map unit, see the following sections in Part II of this publication: Agronomy, Range, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

137—Echeta clay loam, 0 to 6 percent slopes

Setting

Elevation: 4,300 to 4,800 feet
Mean annual precipitation: 15 to 17 inches
Frost-free period: 105 to 130 days

Major Component Description

Echeta and similar soils

Composition: 85 percent
Landform: Alluvial fan, fan remnant
Landform Element: None assigned
Slope: 0 to 6 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Parent Material: Alluvium derived from calcareous shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 3 inches; clay loam
Bw—3 to 15 inches; clay
Bk—15 to 60 inches; clay
Note: Permeability of the Echeta soil is slow. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is medium. The hazard of water erosion is slight. The hazard of wind erosion is moderate.

Typical soil descriptions with range in characteristics are included, in alphabetical order, in the section Soil Series and Their Morphology.

Additional Components

Moorhead: 9 percent
Cromack: 6 percent

Use and Management

This unit is used as rangeland, nonirrigated hayland and pasture, and wildlife habitat. Some areas are also used for homesite and urban development.

This unit is well suited for stockwater ponds, mechanical range renovation, and range seeding. Adequate residue must be maintained on the surface at all times until the seeding is established. Tilled areas must remain narrow and at right angles to the wind. The low annual precipitation should be considered when planning a seeding.

This unit is moderately well suited for nonirrigated hayland and pasture. The main limitation is low annual precipitation. Proper stocking rates, pasture rotation, and restricted grazing during wet periods helps to keep the pasture in good condition and to reduce runoff.

This unit is poorly suited for urban development. The main limitations are the high shrink-swell potential and low strength. The effects of shrinking and swelling can be minimized by using proper engineering designs and by backfilling with material that has low shrink-swell potential. Buildings and roads should be designed to offset the limited ability of this soil to support a load.

For general and detailed information about managing this map unit, see the following sections in Part II of this publication: Agronomy, Range, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

138—Echeta-Cromack clay loams, 6 to 15 percent slopes

Setting

Elevation: 4,300 to 4,800 feet
Mean annual precipitation: 15 to 17 inches
Frost-free period: 105 to 130 days

Major Component Description

Echeta and similar soils

Composition: 45 percent
Landform: Hill, ridge
Landform Element: Backslope, footslope
Slope: 6 to 15 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained

Parent Material: Alluvium derived from calcareous shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 3 inches; clay loam
Bw—3 to 15 inches; clay
Bk—15 to 60 inches; clay
Note: Permeability of the Echeta soil is slow. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is high. The hazard of water erosion is severe. The hazard of wind erosion is moderate.

Cromack and similar soils

Composition: 35 percent
Landform: Hill, ridge
Landform Element: Summit, shoulder
Slope: 6 to 15 percent
Depth to Restrictive Feature: Bedrock (paralithic): 20 to 40 inches
Drainage Class: Well drained
Parent Material: Alluvium over residuum weathered from calcareous shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 6 inches; clay loam
Bw—6 to 14 inches; clay
Bk—14 to 29 inches; clay
Cr—29 to 60 inches; bedrock
Note: Permeability of the Cromack, moist soil is slow. Available water capacity is low. Effective rooting depth is 20 to 40 inches. Runoff is high. The hazard of water erosion is severe. The hazard of wind erosion is moderate.

Typical soil descriptions with range in characteristics are included, in alphabetical order, in the section Soil Series and Their Morphology.

Additional Components

Leiter: 5 percent
Moorhead: 5 percent
Samsil: 5 percent

Use and Management

This unit is used as rangeland and wildlife habitat.

The Echeta soil is moderately well suited for stockwater ponds. The main limitation is slope. The Cromack soil is poorly suited for stockwater ponds. The main limitation is the depth to bedrock.

This unit is well suited for mechanical range renovation and moderately well suited for range seeding. The main limitation is the hazard of water erosion. To reduce the hazard of erosion, adequate residue must be maintained on the surface at all times until the seeding is established. If practical, renovation and tillage for seeding should be along the contour of the slope. The low annual precipitation should be considered when planning a seeding.

For general and detailed information about managing this map unit, see the following sections in Part II of this publication: Agronomy, Range, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

139—Embry-Orpha complex, 3 to 15 percent slopes

Setting

Elevation: 4,100 to 5,000 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 105 to 130 days

Major Component Description

Embry and similar soils

Composition: 40 percent
Landform: Dune
Landform Element: Backslope, footslope
Slope: 3 to 15 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Parent Material: Alluvium and/or eolian deposits derived from sandstone
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 4 inches; fine sandy loam
C—4 to 60 inches; sandy loam
Note: Permeability of the Embry soil is moderately rapid. Available water capacity is low. Effective rooting depth is 60 inches or more. Runoff is low. The hazard of water and wind erosion is severe.

Orpha and similar soils

Composition: 40 percent
Landform: Dune
Landform Element: Backslope, footslope
Slope: 3 to 15 percent
Depth to Restrictive Feature: None noted
Drainage Class: Excessively drained
Parent Material: Eolian deposits derived from sandstone
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 4 inches; fine sand
C—4 to 60 inches; fine sand
Note: Permeability of the Orpha soil is very rapid. Available water capacity is low. Effective rooting depth is 60 inches or more. Runoff is very low. The hazard of water erosion is slight. The hazard of wind erosion is severe.

Typical soil descriptions with range in characteristics are included, in alphabetical order, in the section Soil Series and Their Morphology.

Additional Components

Decolney: 5 percent
Julesburg: 5 percent
Pugsley: 5 percent
Tullock: 5 percent

Use and Management

This unit is used as rangeland and wildlife habitat.

This unit is poorly suited for stockwater ponds. The main limitation is the high potential for seepage losses.

The Orpha soil is poorly suited and the Embry soil is moderately suited for mechanical range renovation and range seeding. The main limitation of this unit for range seeding is the hazard of wind erosion. Mechanical range renovation on this unit may not be economically feasible due to the coarse texture of the surface layer of the soils. To reduce the hazard of wind erosion, adequate residue must be maintained on the surface at all times until the seeding is established. Tilled areas must remain narrow and at right angles to the wind. The low annual precipitation should be considered when planning a seeding.

For general and detailed information about managing this map unit, see the following sections in Part II of this publication: Agronomy, Range, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

140—Embry-Taluce sandy loams, 3 to 20 percent slopes

Setting

Elevation: 4,200 to 5,000 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 105 to 130 days

Major Component Description

Embry and similar soils

Composition: 50 percent
Landform: Hill, ridge
Landform Element: Backslope, footslope
Slope: 3 to 15 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Parent Material: Alluvium and/or eolian deposits derived from sandstone
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 6 inches; sandy loam
C—6 to 60 inches; sandy loam
Note: Permeability of the Embry soil is moderately rapid. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is low. The hazard of water erosion is moderate. The hazard of wind erosion is severe.

Taluce and similar soils

Composition: 25 percent
Landform: Hill, ridge
Landform Element: Summit, shoulder
Slope: 3 to 20 percent
Depth to Restrictive Feature: Bedrock (paralithic): 10 to 20 inches
Drainage Class: Somewhat excessively drained
Parent Material: Residuum weathered from sandstone
Flooding: None

Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 4 inches; sandy loam
C—4 to 16 inches; sandy loam
Cr—16 to 60 inches; bedrock
Note: Permeability of the Taluce soil is moderately rapid. Available water capacity is very low. Effective rooting depth is 10 to 20 inches. Runoff is very high. The hazard of water and wind erosion is severe. This soil is noneffervescent throughout. This does not affect the use and management of this soil.

Typical soil descriptions with range in characteristics are included, in alphabetical order, in the section Soil Series and Their Morphology.

Additional Components

Shingle: 10 percent
Turnercrest: 10 percent
Julesburg: 5 percent

Use and Management

This unit is used as rangeland and wildlife habitat.

This unit is poorly suited for stockwater ponds. The main limitations are the depth to bedrock within the Taluce soil and the high potential of both soils for seepage losses.

The Embry soil is moderately well suited and the Taluce soil is poorly suited for mechanical range renovation and range seeding. The main limitation for range seeding is the hazard of water and wind erosion. Mechanical range renovation on this unit may not be economically feasible due to the coarse texture of the surface layer of the soils and the low potential to increase the amount of forage on the Taluce soil. To reduce the hazard of erosion, adequate residue must be maintained on the surface at all times until the seeding is established. Tilled areas must remain narrow and at right angles to the wind. The low annual precipitation should be considered when planning a seeding.

For general and detailed information about managing this map unit, see the following sections in Part II of this publication: Agronomy, Range, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

141—Emigha loam, 0 to 3 percent slopes

Setting

Elevation: 4,100 to 5,200 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 105 to 130 days

Major Component Description

Emigha and similar soils

Composition: 85 percent
Landform: Stream terrace
Landform Element: None assigned
Slope: 0 to 3 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Parent Material: Alluvium derived from calcareous shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 1 inches; loam
Bw—1 to 19 inches; silty clay loam
Bk—19 to 60 inches; stratified loam to silty clay loam
Note: Permeability of the Emigha soil is moderate. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is very low. The hazard of water erosion is slight. The hazard of wind erosion is moderate.

Typical soil descriptions with range in characteristics are included, in alphabetical order, in the section Soil Series and Their Morphology.

Additional Components

Arvada, thick surface: 4 percent
Keyner: 4 percent
Ulm: 4 percent
Poorly drained soils: 3 percent

Use and Management

This unit is used primarily as rangeland and wildlife habitat.

This soil is moderately well suited for stockwater ponds. The main limitation is the moderate potential for seepage losses.

This soil is well suited for mechanical range renovation and range seeding. Adequate residue must be maintained on the surface at all times until the seeding is established. Tilled areas must remain narrow and at right angles to the wind. The low annual precipitation should be considered when planning a seeding.

For general and detailed information about managing this map unit, see the following sections in Part II of this publication: Agronomy, Range, Recreation, Wildlife Habitat, Engineering and Soil Properties.

142—Emigha, sodic-Arvada, thick surface complex, 0 to 4 percent slopes

Setting

Elevation: 4,100 to 5,000 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 105 to 130 days

Major Component Description

Emigha and similar soils

Composition: 50 percent
Landform: Fan remnant, stream terrace
Landform Element: None assigned
Slope: 0 to 4 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Parent Material: Alluvium derived from calcareous shale
Flooding: Rare
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Salt Affected: Saline within 30 inches
Sodium Affected: Sodic within 30 inches
Typical profile:
A—0 to 3 inches; silty clay loam
Bn—3 to 14 inches; silty clay loam
Bkn—14 to 60 inches; stratified silt loam to silty clay
Note: Permeability of the Emigha, sodic soil is moderately slow. Available water capacity is high. Effective rooting depth is 60 inches or more for salt-tolerant plants. Runoff is medium to rapid. The hazard of water and wind erosion is slight. This soil is subject to rare flooding for very brief periods during prolonged, high intensity storms from April through July.

Arvada and similar soils

Composition: 30 percent
Landform: Fan remnant, stream terrace
Landform Element: None assigned
Slope: 0 to 4 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Parent Material: Alluvium derived from calcareous shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Salt Affected: Saline within 30 inches
Sodium Affected: Sodic within 30 inches
Typical profile:
E—0 to 3 inches; loam
Bt—3 to 12 inches; silty clay loam
Btkn—12 to 30 inches; silty clay
Bkny—30 to 46 inches; silty clay loam
C—46 to 60 inches; silty clay loam
Note: Permeability of the Arvada, thick surface soil is slow. Available water capacity is moderate. Effective rooting depth is 60 inches or more for salt-tolerant plants. Runoff is medium. The hazard of water erosion is slight. The hazard of wind erosion is moderate.

Typical soil descriptions with range in characteristics are included, in alphabetical order, in the section Soil Series and Their Morphology.

Additional Components

Emigha, nonsodic: 7 percent
Keyner: 7 percent
Clayey saline soils: 3 percent
Loamy saline soils: 3 percent

Use and Management

This unit is used as rangeland and wildlife habitat.

This unit is moderately suited for stockwater ponds. The main limitation is the saline soil. Due to the salinity of the soil, the water may not be suitable for livestock.

The Emigha soil is poorly suited for mechanical range renovation and range seeding. The main limitation is the salinity and alkalinity of the soil. The Arvada soil is well suited for mechanical range renovation and range seeding. If range seeding is conducted on the Emigha soil, seeding rates may need to be increased and plant species carefully selected because of the

salinity and alkalinity of the soils. Adequate residue must be maintained on the surface at all times until the seeding is established. Tilled areas must remain narrow and at right angles to the wind. The low annual precipitation should be considered when planning a seeding. Mechanical range renovation may not be economically feasible on the Emigha soil due to low potential to increase the amount of forage.

For general and detailed information about managing this map unit, see the following sections in Part II of this publication: Agronomy, Range, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

143—Felix clay, ponded, 0 to 2 percent slopes

Setting

Elevation: 4,100 to 5,200 feet
Mean annual precipitation: 10 to 19 inches
Frost-free period: 105 to 130 days

Major Component Description

Felix and similar soils

Composition: 90 percent
Landform: Depression, playa
Landform Element: None assigned
Slope: 0 to 2 percent
Depth to Restrictive Feature: None noted
Drainage Class: Poorly drained
Parent Material: Alluvium derived from shale
Flooding: None
Water Table: Seasonal water table exists. See Water Features Table for additional information
Ponding: Occasional
Typical profile:
A—0 to 5 inches; clay
Bss—5 to 30 inches; clay
By—30 to 50 inches; clay
Bky—50 to 60 inches; clay
Note: Permeability of the Felix soil is very slow. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is low. The hazard of water erosion is slight. The hazard of wind erosion is moderate. This soil is subject to rare to frequent ponding up to 1.5 feet of water for brief to very long periods from March through July.

Typical soil descriptions with range in characteristics are included, in alphabetical order, in the section Soil Series and Their Morphology.

Additional Components

Bidman: 2 percent
Heldt: 2 percent
Jaywest: 2 percent
Moorhead: 2 percent
Ulm: 2 percent

Use and Management

This unit is used primarily as rangeland and wildlife habitat.

This unit is well suited for stockwater ponds.

This unit is poorly suited for mechanical range renovation and range seeding. The main limitation is the clayey surface layer and the frequency of ponding. This soil is very hard when dry. If it is worked even when slightly wet, a cloddy seedbed will be produced.

For general and detailed information about managing this map unit, see the following sections in Part II of this publication: Agronomy, Range, Recreation, Wildlife Habitat, Engineering, and Soil Properties

144—Forkwood loam, 0 to 6 percent slopes

Setting

Elevation: 4,100 to 5,200 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 105 to 130 days

Major Component Description

Forkwood and similar soils

Composition: 80 percent
Landform: Alluvial fan, fan remnant
Landform Element: None assigned
Slope: 0 to 6 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Parent Material: Alluvium derived from sandstone and shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 2 inches; loam
Bt—2 to 23 inches; clay loam
Bk—23 to 60 inches; loam

Note: Permeability of the Forkwood soil is moderate. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is low. The hazard of water erosion is slight. The hazard of wind erosion is moderate.

Typical soil descriptions with range in characteristics are included, in alphabetical order, in the section Soil Series and Their Morphology.

Additional Components

Cambria: 7 percent
Ulm: 7 percent
Wyotite: 6 percent

Use and Management

This unit is used as rangeland, nonirrigated hayland and pasture, and wildlife habitat.

This unit is moderately well suited for stockwater ponds. The main limitation is the moderate potential for seepage losses.

This unit is well suited for mechanical range renovation and range seeding. Adequate residue must be maintained on the surface at all times until the seeding is established. Tilled areas must remain narrow and at right angles to the wind. The low annual precipitation should be considered when planning a seeding.

This unit is moderately well suited for nonirrigated hayland and pasture. The main limitation is low annual precipitation. Proper grazing use helps to maintain the quality of forage.

For general and detailed information about managing this map unit, see the following sections in Part II of this publication: Agronomy, Range, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

145—Forkwood-Cambria loams, 0 to 6 percent slopes

Setting

Elevation: 4,100 to 5,200 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period:105 to 130 days

Major Component Description

Forkwood and similar soils

Composition: 45 percent
Landform: Alluvial fan, fan remnant
Landform Element: None assigned
Slope: 0 to 6 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Parent Material: Alluvium derived from sandstone and shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 3 inches; loam
Bt—3 to 14 inches; clay loam
Bk—14 to 60 inches; loam
Note: Permeability of the Forkwood soil is moderate. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is low. The hazard of water erosion is slight. The hazard of wind erosion is moderate.

Cambria and similar soils

Composition: 35 percent
Landform: Alluvial fan, fan remnant
Landform Element: None assigned
Slope: 0 to 6 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Parent Material: Alluvium derived from sandstone and shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 2 inches; loam
Bt—2 to 12 inches; clay loam
Bk—12 to 60 inches; loam
Note: Permeability of the Cambria soil is moderate. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is low. The hazard of water erosion is slight. The hazard of wind erosion is moderate.

Typical soil descriptions with range in characteristics are included, in alphabetical order, in the section Soil Series and Their Morphology.

Additional Components

Areas with 6-10 percent slopes: 4 percent
Cushman: 4 percent
Ulm: 4 percent
Wyotite: 4 percent
Zigweid: 4 percent

Use and Management

This unit is used as rangeland, nonirrigated hayland and pasture, and wildlife habitat.

This unit is moderately well suited for stockwater ponds. The main limitation is the moderate potential for seepage losses.

This unit is well suited for mechanical range renovation and range seeding. Adequate residue must be maintained on the surface at all times until the seeding is established. Tilled areas must remain narrow and at right angles to the wind. The low annual precipitation should be considered when planning a seeding.

This unit is moderately well suited for nonirrigated hayland and pasture. The main limitation is low annual precipitation. Proper grazing use helps to maintain the quality of forage.

For general and detailed information about managing this map unit, see the following sections in Part II of this publication: Agronomy, Range, Recreation, Wildlife Habitat, Engineering and Soil Properties.

146—Forkwood-Cushman loams, 0 to 6 percent slopes

Setting

Elevation: 4,100 to 5,200 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 105 to 130 days

Major Component Description

Forkwood and similar soils

Composition: 50 percent
Landform: Hill, ridge
Landform Element: Backslope, footslope
Slope: 0 to 6 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Parent Material: Alluvium derived from sandstone and shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 2 inches; loam
Bt—2 to 23 inches; clay loam
Bk—23 to 60 inches; loam
Note: Permeability of the Forkwood soil is moderate. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is low. The hazard of water erosion is slight. The hazard of wind erosion is moderate.

Cushman and similar soils

Composition: 30 percent
Landform: Hill, ridge
Landform Element: Summit, shoulder
Slope: 0 to 6 percent
Depth to Restrictive Feature: Bedrock (paralithic): 20 to 40 inches
Drainage Class: Well drained
Parent Material: Alluvium over residuum weathered from sandstone and shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 2 inches; loam
Bt—2 to 23 inches; clay loam
Bk—23 to 30 inches; loam
Cr—30 to 60 inches; bedrock
Note: Permeability of the Cushman soil is moderate. Available water capacity is moderate. Effective rooting depth is 20 to 40 inches. Runoff is low. The hazard of water erosion is slight. The hazard of wind erosion is moderate.

Typical soil descriptions with range in characteristics are included, in alphabetical order, in the section Soil Series and Their Morphology.

Additional Components

Cambria: 5 percent
Theedle: 5 percent
Hiland: 4 percent
Bowbac: 3 percent
Frequently ponded loamy soils: 2 percent
Frequently ponded clayey soils: 1 percent

Use and Management

This unit is used as rangeland, nonirrigated hayland and pasture, and wildlife habitat.

The Forkwood soil is moderately well suited for stockwater ponds. The main limitation is the moderate potential for seepage losses. The Cushman soil is poorly suited for stockwater ponds. The main limitation is the depth to bedrock.

This unit is well suited for mechanical range renovation and range seeding. Adequate residue must be maintained on the surface at all times until the seeding is established. Tilled areas must remain narrow and at right angles to the wind. The low annual precipitation should be considered when planning a seeding.

This unit is moderately well suited for nonirrigated hayland and pasture. The main limitation is low annual precipitation. Rotation grazing maintains optimum vigor and quality of forage.

For general and detailed information about managing this map unit, see the following sections in Part II of this publication: Agronomy, Range, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

147—Forkwood-Cushman loams, 6 to 15 percent slopes

Setting

Elevation: 4,100 to 5,200 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 105 to 130 days

Major Component Description

Forkwood and similar soils

Composition: 50 percent
Landform: Hill, ridge
Landform Element: Backslope, footslope
Slope: 6 to 15 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Parent Material: Alluvium derived from sandstone and shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 2 inches; loam
Bt—2 to 23 inches; clay loam
Bk—23 to 60 inches; loam
Note: Permeability of the Forkwood soil is moderate. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is medium. The hazard of water erosion is severe. The hazard of wind erosion is moderate.

Cushman and similar soils

Composition: 30 percent
Landform: Hill, ridge
Landform Element: Summit, shoulder
Slope: 6 to 15 percent
Depth to Restrictive Feature: Bedrock (paralithic): 20 to 40 inches
Drainage Class: Well drained
Parent Material: Alluvium over residuum weathered from sandstone and shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 2 inches; loam
Bt—2 to 23 inches; clay loam
Bk—23 to 30 inches; loam
Cr—30 to 60 inches; bedrock
Note: Permeability of the Cushman soil is moderate. Available water capacity is low. Effective rooting depth is 20 to 40 inches. Runoff is medium. The hazard of water erosion is severe. The hazard of wind erosion is moderate.

Typical soil descriptions with range in characteristics are included, in alphabetical order, in the section Soil Series and Their Morphology.

Additional Components

Cambria: 5 percent
Theedle: 5 percent
Ulm: 5 percent
Zigweid: 5 percent

Use and Management

This unit is used primarily as rangeland and wildlife habitat.

The Forkwood soil is moderately well suited for stockwater ponds. The main limitation is the moderate potential for seepage losses. The Cushman soil is poorly suited for stockwater ponds. The main limitation is the depth to bedrock.

This unit is well suited for mechanical range renovation and moderately well suited for range seeding. The main limitation for range seeding is the hazard of water erosion. To reduce the hazard of erosion, adequate residue must be maintained on the surface at all times until the seeding is established. If practical, renovation and tillage for seeding should be

along the contour of the slope. The low annual precipitation should be considered when planning a seeding.

For general and detailed information about managing this map unit, see the following sections in Part II of this publication: Agronomy, Range, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

148—Forkwood-Ulm loams, 0 to 6 percent slopes

Setting

Elevation: 4,100 to 5,200 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 105 to 130 days

Major Component Description

Forkwood and similar soils

Composition: 50 percent
Landform: Alluvial fan, fan remnant
Landform Element: None assigned
Slope: 0 to 6 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Parent Material: Alluvium derived from sandstone and shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 2 inches; loam
Bt—2 to 23 inches; clay loam
Bk—23 to 60 inches; loam
Note: Permeability of the Forkwood soil is moderate. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is low. The hazard of water erosion is slight. The hazard of wind erosion is moderate.

Ulm and similar soils

Composition: 35 percent
Landform: Alluvial fan, fan remnant
Landform Element: None assigned
Slope: 0 to 6 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Parent Material: Alluvium derived from calcareous shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 2 inches; loam
Bt—2 to 22 inches; clay
Bk—22 to 60 inches; clay loam
Note: Permeability of the Ulm soil is slow. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is medium. The hazard of water erosion is slight. The hazard of wind erosion is moderate.

Typical soil descriptions with range in characteristics are included, in alphabetical order, in the section Soil Series and Their Morphology.

Additional Components

Bidman: 4 percent
Cambria: 4 percent
Wyotite: 4 percent
Felix, ponded: 3 percent

Use and Management

This unit is used as rangeland, nonirrigated hayland and pasture, and wildlife habitat.

The Forkwood soil is moderately well suited for stockwater ponds. The main limitation is the moderate potential for seepage losses. The Ulm soil is well suited for stockwater ponds.

This unit is well suited for mechanical range renovation and range seeding. Adequate residue must be maintained on the surface at all times until the seeding is established. Tilled areas must remain narrow and at right angles to the wind. The low annual precipitation should be considered when planning a seeding.

This unit is moderately well suited for nonirrigated hayland and pasture. The main limitation is low annual precipitation. Rotation grazing helps to maintain the quality of forage. Proper grazing use helps to maintain the quality of forage.

For general and detailed information about managing this map unit, see the following sections in Part II of this publication: Agronomy, Range, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

149—Forkwood-Ulm loams, 6 to 15 percent slopes

Setting

Elevation: 4,100 to 5,200 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 105 to 130 days

Major Component Description

Forkwood and similar soils

Composition: 55 percent
Landform: Hill, ridge
Landform Element: Backslope, footslope
Slope: 6 to 15 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Parent Material: Alluvium derived from sandstone and shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 2 inches; loam
Bt—2 to 23 inches; clay loam
Bk—23 to 60 inches; loam
Note: Permeability of the Forkwood soil is moderate. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is medium. The hazard of water erosion is severe. The hazard of wind erosion is moderate.

Ulm and similar soils

Composition: 30 percent
Landform: Hill, ridge
Landform Element: Backslope, footslope
Slope: 6 to 15 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Parent Material: Alluvium derived from calcareous shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 2 inches; loam
Bt—2 to 22 inches; clay loam
Bk—22 to 60 inches; clay loam
Note: Permeability of the Ulm soil is slow. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is high. The hazard of water erosion is moderate to severe. The hazard of wind erosion is moderate.

Typical soil descriptions with range in characteristics are included, in alphabetical order, in the section Soil Series and Their Morphology.

Additional Components

Cambria: 5 percent
Cushman: 5 percent
Renohill: 5 percent

Use and Management

This unit is used primarily as rangeland and wildlife habitat.

This unit is moderately well suited for stockwater ponds due to the moderate potential of the Forkwood soil for seepage losses and the steepness of slope of this unit.

This unit is well suited for mechanical range renovation and moderately well suited for range seeding. The main limitation is the hazard of water erosion. To reduce the hazard of erosion, adequate residue must be maintained on the surface at all times until the seeding is established. If practical, renovation and tillage for seeding should be along the contour of the slope. The low annual precipitation should be considered when planning a seeding.

For general and detailed information about managing this map unit, see the following sections in Part II of this publication: Agronomy, Range, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

150—Gateson-Taluce-Turnercrest complex, 6 to 30 percent slopes

Setting

Elevation: 4,100 to 5,200 feet
Mean annual precipitation: 10 to 17 inches
Frost-free period: 105 to 130 days

Major Component Description

Gateson and similar soils

Composition: 40 percent
Landform: Hill, ridge
Landform Element: Backslope, summit
Slope: 6 to 30 percent

Depth to Restrictive Feature: Bedrock (paralithic): 20 to 40 inches
Drainage Class: Well drained
Parent Material: Alluvium and/or eolian deposits over residuum weathered from sandstone and shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
Oi—0 to 2 inches; slightly decomposed plant material
E—2 to 6 inches; loamy fine sand
EB—6 to 11 inches; stratified loamy fine sand to sandy clay loam
Bt—11 to 30 inches; sandy clay loam
Cr—30 to 60 inches; bedrock
Note: Permeability of the Gateson soil is moderate. Available water capacity is low. Effective rooting depth is 20 to 40 inches. Runoff is very high. The hazard of water and wind erosion is severe.

Taluce and similar soils

Composition: 20 percent
Landform: Hill, ridge
Landform Element: Summit, shoulder
Slope: 6 to 30 percent
Depth to Restrictive Feature: Bedrock (paralithic): 10 to 20 inches
Drainage Class: Somewhat excessively drained
Parent Material: Residuum weathered from sandstone
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 3 inches; sandy loam
C—3 to 16 inches; sandy loam
Cr—16 to 60 inches; bedrock
Note: Permeability of the Taluce soil is moderately rapid. Available water capacity is very low. Effective rooting depth is 10 to 20 inches. Runoff is very high. The hazard of water and wind erosion is severe. This soil is noneffervescent throughout. This does not affect the use and management of this soil.

Turnercrest and similar soils

Composition: 20 percent
Landform: Hill, ridge
Landform Element: Backslope, summit
Slope: 6 to 30 percent
Depth to Restrictive Feature: Bedrock (paralithic): 20 to 40 inches
Drainage Class: Well drained
Parent Material: Alluvium and/or eolian deposits and/or residuum weathered from sandstone
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 4 inches; loamy fine sand
C—4 to 32 inches; sandy loam
Cr—32 to 60 inches; bedrock
Note: Permeability of the Turnercrest soil is moderately rapid. Available water capacity is low. Effective rooting depth is 20 to 40 inches. Runoff is low. The hazard of water erosion is moderate. The hazard of wind erosion is severe. This soil is noneffervescent throughout. This does not affect the use and management of this soil.

Typical soil descriptions with range in characteristics are included, in alphabetical order, in the section Soil Series and Their Morphology.

Additional Components

Badland: 5 percent
Decolney: 5 percent
Embry: 5 percent
Orpha: 5 percent

Use and Management

This unit is used for wildlife habitat and rangeland.

This unit is poorly suited for stockwater ponds, mechanical range renovation, and range seeding. The main limitations are depth to bedrock, steepness of slope, and the hazard of water and wind erosion.

The Gateson soil is well suited to the production of ponderosa pine. The main concerns in producing and harvesting timber are the severe hazards of water and wind erosion and steepness of slope. The site index for ponderosa pine is about 40. Management that minimizes the risk of water and wind erosion is essential in harvesting timber. Conventional methods of harvesting trees can be used in the more gently sloping areas but are difficult to use in the steeper areas.

For general and detailed information about managing this map unit, see the following sections in Part II of

this publication: Agronomy, Range, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

151—Haverdad loam, 0 to 3 percent slopes

Setting

Elevation: 4,100 to 5,000 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 105 to 130 days

Major Component Description

Haverdad and similar soils

Composition: 80 percent
Landform: Flood plain, stream terrace
Landform Element: None assigned
Slope: 0 to 3 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Parent Material: Alluvium derived from sandstone and shale
Flooding: Occasional
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 4 inches; loam
C—4 to 60 inches; stratified fine sandy loam to silt loam
Note: Permeability of the Haverdad soil is moderate. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is low. The hazard of water erosion is slight. The hazard of wind erosion is moderate. This soil is subject to rare to occasional flooding for very brief periods during prolonged, high intensity storms from April through July.

Typical soil descriptions with range in characteristics are included, in alphabetical order, in the section Soil Series and Their Morphology.

Additional Components

Boruff: 5 percent
Clarkelen: 5 percent
Draknab: 5 percent
Kishona: 5 percent

Use and Management

This unit is used primarily as rangeland and wildlife habitat.

This unit is moderately well suited for stockwater ponds. The main limitation is the moderate potential for seepage losses.

This unit is well suited for mechanical range renovation and moderately well suited for range seeding. The main limitation is the hazard of wind erosion. To reduce the hazard of erosion, adequate residue must be maintained on the surface at all times until the seeding is established. Tilled areas must remain narrow and at right angles to the wind. The low annual precipitation should be considered when planning a seeding.

For general and detailed information about managing this map unit, see the following sections in Part II of this publication: Agronomy, Range, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

152—Haverdad-Clarkelen complex, 0 to 4 percent slopes

Setting

Elevation: 4,100 to 4,800 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 105 to 130 days

Major Component Description

Haverdad and similar soils

Composition: 45 percent
Landform: Flood plain, stream terrace
Landform Element: None assigned
Slope: 0 to 4 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Parent Material: Alluvium derived from sandstone and shale
Flooding: Occasional
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 3 inches; loam
C—3 to 60 inches; stratified fine sandy loam to clay loam

Note: Permeability of the Haverdad soil is moderate. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is low. The hazard of water erosion is slight. The hazard of wind erosion is moderate. This soil is subject to rare to occasional flooding for very brief periods during prolonged, high intensity storms from April through July.

Clarkelen and similar soils

Composition: 35 percent
Landform: Flood plain, stream terrace
Landform Element: None assigned
Slope: 0 to 4 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Parent Material: Alluvium derived from sandstone and shale
Flooding: Occasional
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 4 inches; fine sandy loam
C—4 to 60 inches; stratified loamy fine sand to loam
Note: Permeability of the Clarkelen soil is moderately rapid. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is very low. The hazard of water erosion is slight. The hazard of wind erosion is severe. This soil is subject to rare to occasional flooding for very brief periods during prolonged, high intensity storms from April through July.

Typical soil descriptions with range in characteristics are included, in alphabetical order, in the section Soil Series and Their Morphology.

Additional Components

Boruff: 5 percent
Draknab: 5 percent
Keeline: 5 percent
Kishona: 5 percent

Use and Management

This unit is used as rangeland and wildlife habitat.

The Haverdad soil is moderately well suited for stockwater ponds. The main limitation is the moderate potential for seepage losses. The Clarkelen soil is poorly suited for stockwater ponds. The main limitation is the high potential for seepage losses.

The Haverdad soil is well suited for mechanical range renovation and moderately well suited for range seeding. The Clarkelen soil is poorly suited for mechanical range renovation and range seeding. The main limitation for range seeding is the hazard of wind erosion. Mechanical range renovation may not be economically feasible on the Clarkelen soil due to the coarse texture of the surface layer. To reduce the hazard of wind erosion, adequate residue must be maintained on the surface at all times until the seeding is established. Tilled areas must remain narrow and at right angles to the wind. The low annual precipitation should be considered when planning a seeding.

For general and detailed information about managing this map unit, see the following sections in Part II of this publication: Agronomy, Range, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

153—Haverdad-Kishona association, 0 to 6 percent slopes

Setting

Elevation: 4,100 to 5,000 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 105 to 130 days

Major Component Description

Haverdad and similar soils

Composition: 45 percent
Landform: Flood plain, stream terrace
Landform Element: None assigned
Slope: 0 to 3 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Parent Material: Alluvium derived from sandstone and shale
Flooding: Occasional
Water Table: No water table exists above a depth of 6 feet
Ponding: None

Typical profile:
A—0 to 7 inches; clay loam
C—7 to 60 inches; stratified very fine sandy loam to clay loam
Note: Permeability of the Haverdad soil is moderate. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is low. The hazard of water erosion is slight. The hazard of wind erosion is moderate. This soil is subject to rare to occasional flooding for very brief periods during prolonged, high intensity storms from April through July.

Kishona and similar soils

Composition: 35 percent
Landform: Stream terrace
Landform Element: None assigned
Slope: 0 to 6 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Parent Material: Alluvium derived from sandstone and shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 3 inches; clay loam
Bk—3 to 60 inches; clay loam
Note: Permeability of the Kishona soil is moderate. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is low. The hazard of water and wind erosion is moderate.

Typical soil descriptions with range in characteristics are included, in alphabetical order, in the section Soil Series and Their Morphology.

Additional Components

Clarkelen: 7 percent
Keeline: 7 percent
Boruff: 6 percent

Use and Management

This unit is used as rangeland and wildlife habitat.

This unit is moderately well suited for stockwater ponds. The main limitation is the moderate potential for seepage losses.

This unit is well suited for mechanical range renovation and moderately well suited for range seeding. The main limitation is the hazard of wind erosion. To reduce the hazard of wind erosion, adequate residue must be maintained on the surface at all times until the seeding is established. Tilled areas must remain narrow and at right angles to the wind. The low annual precipitation should be considered when planning a seeding.

For general and detailed information about managing this map unit, see the following sections in Part II of this publication: Agronomy, Range, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

154—Heldt clay loam, 0 to 6 percent slopes

Setting

Elevation: 4,100 to 5,000 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 105 to 130 days

Major Component Description

Heldt and similar soils

Composition: 80 percent
Landform: Alluvial fan, fan remnant
Landform Element: None assigned
Slope: 0 to 6 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Parent Material: Alluvium derived from calcareous shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 3 inches; clay loam
Bw—3 to 25 inches; clay
Bk—25 to 60 inches; silty clay
Note: Permeability of the Heldt soil is slow. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is medium. The hazard of water and wind erosion is moderate.

Typical soil descriptions with range in characteristics are included, in alphabetical order, in the section Soil Series and Their Morphology.

Additional Components

Ulm: 7 percent
Bidman: 4 percent

Absted: 3 percent
Nuncho: 2 percent
Platmak: 2 percent
Wyarno: 2 percent

Use and Management

This unit is used primarily as rangeland and wildlife habitat.

This unit is well suited for stockwater ponds and mechanical range renovation and moderately well suited for range seeding. The main limitation is the hazard of erosion. To reduce the hazard of erosion, adequate residue must be maintained on the surface at all times until the seeding is established. Tilled areas must remain narrow and at right angles to the wind. The low annual precipitation should be considered when planning a seeding.

For general and detailed information about managing this map unit, see the following sections in Part II of this publication: Agronomy, Range, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

155—Heldt-Bidman complex, saline, 0 to 3 percent slopes

Setting

Elevation: 4,100 to 5,000 feet
Mean annual precipitation: 10 to 17 inches
Frost-free period: 105 to 130 days

Major Component Description

Heldt and similar soils

Composition: 45 percent
Landform: Fan remnant, stream terrace
Landform Element: None assigned
Slope: 0 to 3 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Parent Material: Alluvium derived from calcareous shale
Flooding: Frequent
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Salt Affected: Saline within 2 inches
Sodium Affected: Not affected
Typical profile:
A—0 to 2 inches; clay loam
Bny—2 to 22 inches; clay
Bkny—22 to 60 inches; clay
Note: Permeability of the Heldt, saline soil is slow. Available water capacity is high. Effective rooting depth is 60 inches or more for salt-tolerant plants. Runoff is medium. The hazard of water erosion is slight. The hazard of wind erosion is moderate. This soil is subject to rare to frequent ponding up to 1.5 feet of water for brief to very long periods from March through July.

Bidman and similar soils

Composition: 35 percent
Landform: Fan remnant, stream terrace
Landform Element: None assigned
Slope: 0 to 3 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Parent Material: Alluvium derived from calcareous shale
Flooding: Frequent
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Salt Affected: Saline within 4 inches
Sodium Affected: Not affected
Typical profile:
E—0 to 4 inches; loam
Btn—4 to 13 inches; clay
Bkny—13 to 60 inches; clay loam
Note: Permeability of the Bidman, saline soil is slow. Available water capacity is high. Effective rooting depth is 60 inches or more for salt-tolerant plants. Runoff is medium. The hazard of water erosion is slight. The hazard of wind erosion is moderate. This soil is subject to rare to frequent ponding up to 1.5 feet of water for brief to very long periods from March through July.

Typical soil descriptions with range in characteristics are included, in alphabetical order, in the section Soil Series and Their Morphology.

Additional Components

Felix, ponded: 7 percent
Forkwood: 5 percent
Slickspots: 5 percent
Ulm: 3 percent

Use and Management

This unit is used as rangeland and wildlife habitat.

This unit is well suited for stockwater ponds.

This unit is moderately well suited for mechanical range renovation and range seeding. The main limitation is the moderate salinity in the subsoil of these soils. The hazard of wind erosion is also a limitation for range seeding. If range seeding is conducted, seeding rates may need to be increased and plant species carefully selected because of the salinity of the soils. To reduce the hazard of wind erosion, adequate residue must be maintained on the surface at all times until the seeding is established. Tilled areas must remain narrow and at right angles to the wind. The low annual precipitation should be considered when planning a seeding.

For general and detailed information about managing this map unit, see the following sections in Part II of this publication: Agronomy, Range, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

156—Hiland fine sandy loam, 0 to 6 percent slopes

Setting

Elevation: 4,100 to 5,300 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 105 to 130 days

Major Component Description

Hiland and similar soils

Composition: 85 percent
Landform: Alluvial fan, fan remnant
Landform Element: None assigned
Slope: 0 to 6 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Parent Material: Alluvium and/or eolian deposits derived from sandstone and shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 3 inches; fine sandy loam
Bt—3 to 19 inches; sandy clay loam
Bk—19 to 60 inches; sandy loam
Note: Permeability of the Hiland soil is moderate. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is low. The hazard of water erosion is slight. The hazard of wind erosion is severe.

Typical soil descriptions with range in characteristics are included, in alphabetical order, in the section Soil Series and Their Morphology.

Additional Components

Forkwood: 4 percent
Moskee: 4 percent
Vonalee: 4 percent
Maysdorf: 3 percent

Use and Management

This unit is used as rangeland, nonirrigated hayland and pasture, and wildlife habitat.

This unit is poorly suited for stockwater ponds. The main limitation is the high potential for seepage losses.

This unit is poorly suited for mechanical range renovation and range seeding. The main limitation for range seeding is the hazard of wind erosion. Mechanical range renovation may not be economically feasible due to the coarse texture of the surface layer. To reduce the hazard of wind erosion, adequate residue must be maintained on the surface at all times until the seeding is established. Tilled areas must remain narrow and at right angles to the wind. The low annual precipitation should be considered when planning a seeding.

If this unit is used for hayland and pasture, the main limitation is low annual precipitation. Rotation grazing maintains optimum vigor and quality of forage.

For general and detailed information about managing this map unit, see the following sections in Part II of this publication: Agronomy, Range, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

157—Hiland-Bowbac fine sandy loams, 0 to 6 percent slopes

Setting

Elevation: 4,100 to 5,300 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 105 to 130 days

Major Component Description

Hiland and similar soils

Composition: 50 percent
Landform: Hill, ridge
Landform Element: Backslope, footslope
Slope: 0 to 6 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Parent Material: Alluvium and/or eolian deposits derived from sandstone and shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 4 inches; fine sandy loam
Bt—4 to 24 inches; sandy clay loam
Bk—24 to 60 inches; sandy loam
Note: Permeability of the Hiland soil is moderate. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is low. The hazard of water erosion is slight. The hazard of wind erosion is severe.

Bowbac and similar soils

Composition: 30 percent
Landform: Hill, ridge
Landform Element: Summit, shoulder
Slope: 0 to 6 percent
Depth to Restrictive Feature: Bedrock (paralithic): 20 to 40 inches
Drainage Class: Well drained
Parent Material: Alluvium and/or eolian deposits over residuum weathered from calcareous sandstone
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 3 inches; fine sandy loam
Bt—3 to 31 inches; sandy clay loam
Bk—31 to 39 inches; sandy loam
Cr—39 to 60 inches; bedrock
Note: Permeability of the Bowbac soil is moderate. Available water capacity is moderate. Effective rooting depth is 20 to 40 inches. Runoff is low. The hazard of water erosion is slight. The hazard of wind erosion is severe.

Typical soil descriptions with range in characteristics are included, in alphabetical order, in the section Soil Series and Their Morphology.

Additional Components

Cushman: 5 percent
Forkwood: 5 percent
Terro: 5 percent
Vonalee: 5 percent

Use and Management

This unit is used as rangeland, nonirrigated hayland and pasture, and wildlife habitat.

This unit is poorly suited for stockwater ponds. The main limitation is the high potential for seepage losses. The depth to bedrock within the Bowbac soil is also a limitation.

This unit is poorly suited for mechanical range renovation and range seeding. The main limitation for range seeding is the hazard of wind erosion. Mechanical range renovation may not be economically feasible due to the coarse texture of the surface layer. To reduce the hazard of wind erosion, adequate residue must be maintained on the surface at all times until the seeding is established. Tilled areas must remain narrow and at right angles to the wind. The low annual precipitation should be considered when planning a seeding.

If this unit is used for nonirrigated hayland and pasture, the main limitation is low annual precipitation. Using management practices such as rotation grazing maintains optimum vigor and quality of forage.

For general and detailed information about managing this map unit, see the following sections in Part II of this publication: Agronomy, Range, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

158—Hiland-Bowbac fine sandy loams, 6 to 15 percent slopes

Setting

Elevation: 4,100 to 5,300 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 105 to 130 days

Major Component Description

Hiland and similar soils

Composition: 45 percent
Landform: Hill, ridge
Landform Element: Backslope, footslope
Slope: 6 to 15 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Parent Material: Alluvium and/or eolian deposits derived from sandstone and shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 4 inches; fine sandy loam
Bt—4 to 24 inches; sandy clay loam
Bk—24 to 60 inches; sandy loam
Note: Permeability of the Hiland soil is moderate. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is medium. The hazard of water and wind erosion is severe.

Bowbac and similar soils

Composition: 35 percent
Landform: Hill, ridge
Landform Element: Summit, shoulder
Slope: 6 to 15 percent
Depth to Restrictive Feature: Bedrock (paralithic): 20 to 40 inches
Drainage Class: Well drained
Parent Material: Alluvium and/or eolian deposits over residuum weathered from calcareous sandstone
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 3 inches; fine sandy loam
Bt—3 to 31 inches; sandy clay loam
Bk—31 to 39 inches; sandy loam
Cr—39 to 60 inches; bedrock
Note: Permeability of the Bowbac soil is moderate. Available water capacity is very low. Effective rooting depth is 20 to 40 inches. Runoff is medium. The hazard of water and wind erosion is severe.

Typical soil descriptions with range in characteristics are included, in alphabetical order, in the section Soil Series and Their Morphology.

Additional Components

Decolney: 4 percent
Maysdorf: 4 percent
Terro: 4 percent
Vonalee: 4 percent
Worf: 4 percent

Use and Management

This unit is used as rangeland and wildlife habitat. Occasional coniferous trees occur on this unit in some areas in the Rochelle Hills.

This unit is poorly suited for stockwater ponds. The main limitation is the high potential for seepage losses. The depth to bedrock within the Bowbac soil is also a limitation.

This unit is poorly suited for mechanical range renovation and range seeding. The main limitation for range seeding is the hazard of erosion. Mechanical range renovation may not be economically feasible due to the coarse texture of the surface layer. To reduce the hazard of erosion, adequate residue must be maintained on the surface at all times until the seeding is established. Tilled areas must remain narrow and at right angles to the wind. The low annual precipitation should be considered when planning a seeding.

For general and detailed information about managing this map unit, see the following sections in Part II of this publication: Agronomy, Range, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

159—Hiland-Vonalee fine sandy loams, 0 to 6 percent slopes

Setting

Elevation: 4,100 to 5,200 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 105 to 130 days

Major Component Description

Hiland and similar soils

Composition: 50 percent
Landform: Alluvial fan, hill
Landform Element: Footslope
Slope: 0 to 6 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Parent Material: Alluvium and/or eolian deposits derived from sandstone and shale

Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 3 inches; fine sandy loam
Bt—3 to 23 inches; sandy clay loam
Bk—23 to 60 inches; sandy loam
Note: Permeability of the Hiland soil is moderate. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is low. The hazard of water erosion is slight. The hazard of wind erosion is severe.

Vonalee and similar soils

Composition: 35 percent
Landform: Alluvial fan, hill
Landform Element: Footslope
Slope: 0 to 6 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Parent Material: Alluvium and/or eolian deposits derived from calcareous sandstone
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 5 inches; fine sandy loam
Bt—5 to 16 inches; sandy loam
Bk—16 to 60 inches; sandy loam
Note: Permeability of the Vonalee soil is moderately rapid. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is very low. The hazard of water erosion is slight. The hazard of wind erosion is severe.

Typical soil descriptions with range in characteristics are included, in alphabetical order, in the section Soil Series and Their Morphology.

Additional Components

Decolney: 7 percent
Bowbac: 4 percent
Terro: 4 percent

Use and Management

This unit is used as rangeland, nonirrigated hayland and pasture, and wildlife habitat.

This unit is poorly suited for stockwater ponds. The main limitation is the high potential for seepage losses.

This unit is poorly suited for mechanical range renovation and range seeding. The main limitation for range seeding is the hazard of wind erosion. Mechanical range renovation may not be economically feasible due to the coarse texture of the surface layer. To reduce the hazard of wind erosion, adequate residue must be maintained on the surface at all times until the seeding is established. Tilled areas must remain narrow and at right angles to the wind. The low annual precipitation should be considered when planning a seeding.

If this unit is used for hayland and pasture, the main limitation is low annual precipitation. Using grazing and hayland management practices such as proper grazing use helps to maintain the quality of forage.

For general and detailed information about managing this map unit, see the following sections in Part II of this publication: Agronomy, Range, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

160—Hiland-Vonalee fine sandy loams, 6 to 15 percent slopes

Setting

Elevation: 4,100 to 5,200 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 105 to 130 days

Major Component Description

Hiland and similar soils

Composition: 45 percent
Landform: Hill, ridge
Landform Element: Backslope, footslope
Slope: 6 to 15 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Parent Material: Alluvium and/or eolian deposits derived from sandstone and shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 3 inches; fine sandy loam
Bt—3 to 23 inches; sandy clay loam
Bk—23 to 60 inches; sandy loam
Note: Permeability of the Hiland soil is moderate. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is medium. The hazard of water and wind erosion is severe.

Vonalee and similar soils

Composition: 40 percent
Landform: Hill, ridge
Landform Element: Backslope, footslope
Slope: 6 to 15 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Parent Material: Alluvium and/or eolian deposits derived from calcareous sandstone
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 5 inches; fine sandy loam
Bt—5 to 24 inches; sandy loam
Bk—24 to 60 inches; sandy loam
Note: Permeability of the Vonalee soil is moderately rapid. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is low. The hazard of water and wind erosion is severe.

Typical soil descriptions with range in characteristics are included, in alphabetical order, in the section Soil Series and Their Morphology.

Additional Components

Bowbac: 4 percent
Decolney: 4 percent
Terro: 4 percent
Areas with 3-6 percent slopes: 3 percent

Use and Management

This unit is used as rangeland and wildlife habitat.

This unit is poorly suited for stockwater ponds. The main limitation is the high potential for seepage losses.

This unit is poorly suited for mechanical range renovation and range seeding. The main limitation for range seeding is the hazard of erosion. Mechanical range renovation may not be economically feasible due to the coarse texture of the surface layer. To reduce the hazard of erosion, adequate residue must be maintained on the surface at all times until the seeding is established. Tilled areas must remain narrow and at right angles to the wind. The low annual precipitation should be considered when planning a seeding.

For general and detailed information about managing this map unit, see the following sections in Part II of this publication: Agronomy, Range, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

161—Hilight-Taluce, cool-Wags complex, 6 to 40 percent slopes

Setting

Elevation: 4,100 to 4,900 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 105 to 130 days

Major Component Description

Hilight and similar soils

Composition: 40 percent
Landform: Break, hill, ridge
Landform Element: Summit, shoulder
Slope: 6 to 40 percent
Depth to Restrictive Feature: Bedrock (paralithic): 10 to 20 inches
Drainage Class: Well drained
Parent Material: Residuum weathered from acid shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 2 inches; clay loam
C—2 to 14 inches; clay
Cr—14 to 60 inches; bedrock
Note: Permeability of the Hilight is slow. Available water capacity is very low. Effective rooting depth is 10 to 20 inches. Runoff is very high. The hazard water erosion is severe. The hazard of wind erosion is moderate.

Taluce and similar soils

Composition: 25 percent
Landform: Hill, ridge
Landform Element: Summit, shoulder
Slope: 6 to 40 percent
Depth to Restrictive Feature: Bedrock (paralithic): 10 to 20 inches
Drainage Class: Somewhat excessively drained
Parent Material: Residuum weathered from sandstone
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None

Typical profile:
A—0 to 4 inches; sandy loam
C—4 to 18 inches; sandy loam
Cr—18 to 60 inches; bedrock
Note: Permeability of the Taluce, cool soil is moderately rapid. Available water capacity is very low. Effective rooting depth is 10 to 20 inches. Runoff is very high. The hazard of water and wind erosion is severe.

Wags and similar soils

Composition: 15 percent
Landform: Hill, ridge
Landform Element: Backslope, summit
Slope: 6 to 30 percent
Depth to Restrictive Feature: Bedrock (paralithic): 20 to 40 inches
Drainage Class: Well drained
Parent Material: Alluvium over residuum weathered from acid shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 4 inches; clay
C—4 to 34 inches; clay
Cr—34 to 60 inches; bedrock
Note: Permeability of the Wags soil is slow. Available water capacity is moderate. Effective rooting depth is 20 to 40 inches. Runoff is very high. The hazard of water erosion is severe. The hazard of wind erosion is moderate.

Typical soil descriptions with range in characteristics are included, in alphabetical order, in the section Soil Series and Their Morphology.

Additional Components

Moderately deep loamy soils: 8 percent
Badland: 7 percent
Gullies with 40-80% slopes: 5 percent

Use and Management

This unit is used for wildlife habitat and rangeland.

This unit is poorly suited for stockwater ponds, mechanical range renovation, and range seeding. The main limitations are depth to bedrock, steepness of slope, and the hazard of water and wind erosion.

For general and detailed information about managing this map unit, see the following sections in Part II of this publication: Agronomy, Range, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

162—Lismas-Mittenbutte, cool-Sabatka complex, 6 to 40 percent slopes

Setting

Elevation: 4,100 to 4,800 feet
Mean annual precipitation: 15 to 17 inches
Frost-free period: 105 to 130 days

Major Component Description

Lismas and similar soils

Composition: 30 percent
Landform: Hill, ridge
Landform Element: Summit, shoulder
Slope: 6 to 40 percent
Depth to Restrictive Feature: Bedrock (paralithic): 10 to 20 inches
Drainage Class: Well drained
Parent Material: Residuum weathered from acid shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 3 inches; clay loam
Cy—3 to 16 inches; clay
Cr—16 to 60 inches; bedrock
Note: Permeability of the Lismas soil is very slow. Available water capacity is very low. Effective rooting depth is 10 to 20 inches. Runoff is very high. The hazard of water erosion is severe. The hazard of wind erosion is moderate.

Mittenbutte and similar soils

Composition: 30 percent
Landform: Hill, ridge
Landform Element: Summit, shoulder
Slope: 6 to 40 percent
Depth to Restrictive Feature: Bedrock (paralithic): 10 to 20 inches
Drainage Class: Well drained
Parent Material: Residuum weathered from sandstone
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None

Typical profile:
A—0 to 4 inches; fine sandy loam
C—4 to 18 inches; fine sandy loam
Cr—18 to 60 inches; bedrock
Note: Permeability of the Mittenbutte, cool soil is moderately rapid. Available water capacity is very low. Effective rooting depth is 10 to 20 inches. Runoff is very high. The hazard of water and wind erosion is severe.

Sabatka and similar soils

Composition: 20 percent
Landform: Hill, ridge
Landform Element: Backslope, summit
Slope: 6 to 30 percent
Depth to Restrictive Feature: Bedrock (paralithic): 20 to 40 inches
Drainage Class: Well drained
Parent Material: Alluvium over residuum weathered from acid shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 3 inches; clay loam
Bw—3 to 19 inches; clay
C—19 to 30 inches; clay
Cr—30 to 60 inches; bedrock
Note: Permeability of the Sabatka soil is slow. Available water capacity is low. Effective rooting depth is 20 to 40 inches. Runoff is rapid. The hazard of water erosion is severe. The hazard of wind erosion is moderate.

Typical soil descriptions with range in characteristics are included, in alphabetical order, in the section Soil Series and Their Morphology.

Additional Components

Moderately deep loamy soils: 8 percent
Badland: 7 percent
Gullies with 40-80% slopes: 5 percent

Use and Management

This unit is used for wildlife habitat and rangeland. Ponderosa pine and Rocky Mountain juniper invade this mapping unit. Canopy cover is less than 15 percent.

This unit is poorly suited for stockwater ponds, mechanical range renovation, and range seeding. The main limitations are depth to bedrock, steepness of slope, and the hazard of water and wind erosion.

For general and detailed information about managing this map unit, see the following sections in Part II of this publication: Agronomy, Range, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

163—Hilight-Wags-Badland complex, 3 to 45 percent slopes

Setting

Elevation: 4,100 to 5,200 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 105 to 130 days

Major Component Description

Hilight and similar soils

Composition: 35 percent
Landform: Hill, ridge, break
Landform Element: Summit, shoulder
Slope: 3 to 45 percent
Depth to Restrictive Feature: Bedrock (paralithic): 10 to 20 inches
Drainage Class: Well drained
Parent Material: Residuum weathered from acid shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 2 inches; clay
C—2 to 12 inches; clay
Cr—12 to 60 inches; bedrock
Note: Permeability of the Hilight soil is slow. Available water capacity is very low. Effective rooting depth is 10 to 20 inches. Runoff is very high. The hazard of water erosion is severe. The hazard of wind erosion is moderate.

Wags and similar soils

Composition: 30 percent
Landform: Hill, ridge
Landform Element: Summit, shoulder
Slope: 3 to 30 percent
Depth to Restrictive Feature: Bedrock (paralithic): 20 to 40 inches
Drainage Class: Well drained

Parent Material: Alluvium over residuum weathered from acid shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 1 inches; channery clay loam
C—1 to 23 inches; silty clay
Cr—23 to 60 inches; bedrock
Note: Permeability of the Wags soil is slow. Available water capacity is low. Effective rooting depth is 20 to 40 inches. Runoff is very high. The hazard of water erosion is severe. The hazard of wind erosion is moderate.

Badland

Composition: 10 percent
Landform: Hill, ridge
Landform Element: Summit, shoulder
Slope: —-
Depth to Restrictive Feature: Bedrock (paralithic): 0 to 0 inches
Drainage Class: —
Parent Material: Residuum weathered from sandstone and shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Note: Badland consists of exposures of interbedded, noneffervescent shale and sandstone.

Typical soil descriptions with range in characteristics are included, in alphabetical order, in the section Soil Series and Their Morphology.

Additional Components

Samday: 6 percent
Savageton: 6 percent
Shingle: 6 percent
Taluce: 6 percent
Poorly drained clayey soils: 1 percent

Use and Management

This unit is used as rangeland and wildlife habitat.

This unit is poorly suited for stockwater ponds, mechanical range renovation, and range seeding. The main limitations are depth to bedrock, steepness of slope, and the hazard of water and wind erosion.

For general and detailed information about managing this map unit, see the following sections in Part II of this publication: Agronomy, Range, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

164—Lismas-Sabatka-Badland complex, 3 to 45 percent slopes

Setting

Elevation: 4,100 to 4,800 feet
Mean annual precipitation: 15 to 17 inches
Frost-free period: 105 to 130 days

Major Component Description

Lismas and similar soils

Composition: 35 percent
Landform: Hill, ridge
Landform Element: Summit, shoulder
Slope: 3 to 45 percent
Depth to Restrictive Feature: Bedrock (paralithic): 10 to 20 inches
Drainage Class: Well drained
Parent Material: Residuum weathered from acid shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 3 inches; clay loam
Cy—3 to 16 inches; clay
Cr—16 to 60 inches; bedrock
Note: Permeability of the Lismas soil is very slow. Available water capacity is very low. Effective rooting depth is 10 to 40 inches. Runoff is very high. The hazard of water erosion is severe. The hazard of wind erosion is moderate.

Sabatka and similar soils

Composition: 30 percent
Landform: Hill, ridge
Landform Element: Summit, shoulder
Slope: 3 to 30 percent
Depth to Restrictive Feature: Bedrock (paralithic): 20 to 40 inches
Drainage Class: Well drained
Parent Material: Alluvium over residuum weathered from acid shale
Flooding: None

Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 3 inches; clay loam
Bw—3 to 19 inches; clay
C—19 to 30 inches; clay
Cr—30 to 60 inches; bedrock
Note: Permeability of the Sabatka soil is very slow. Available water capacity is low. Effective rooting depth is 20 to 40 inches. Runoff is very high. The hazard of water erosion is severe. The hazard of wind erosion is moderate.

Badland

Composition: 10 percent
Landform: Hill, ridge
Landform Element: Summit, shoulder
Slope: —-
Depth to Restrictive Feature: Bedrock (paralithic): 0 to 0 inches
Drainage Class: —-
Parent Material: Residuum weathered from sandstone and shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Note: Badland consists of exposures of interbedded, noneffervescent shale and sandstone.

Typical soil descriptions with range in characteristics are included, in alphabetical order, in the section Soil Series and Their Morphology.

Additional Components

Cromack: 7 percent
Mittenbutte: 7 percent
Fairburn: 5 percent
Ironbutte: 5 percent
Poorly drained clayey soils: 1 percent

Use and Management

This unit is used as rangeland and wildlife habitat. Ponderosa pine and Rocky Mountain juniper invade this mapping unit, canopy cover is less than 15 percent.

This unit is poorly suited for stockwater ponds, mechanical range renovation, and range seeding. The main limitations are depth to bedrock, steepness of slope, and the hazard of water and wind erosion.

For general and detailed information about managing this map unit, see the following sections in Part II of this publication: Agronomy, Range, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

165—Jayem fine sandy loam, 6 to 20 percent slopes

Setting

Elevation: 4,100 to 5,200 feet
Mean annual precipitation: 14 to 17 inches
Frost-free period: 105 to 130 days

Major Component Description

Jayem and similar soils

Composition: 80 percent
Landform: Hill
Landform Element: Backslope, footslope
Slope: 6 to 20 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Parent Material: Eolian deposits derived from sandstone
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 17 inches; fine sandy loam
Bw—17 to 31 inches; fine sandy loam
C—31 to 60 inches; fine sandy loam
Note: Permeability of the Jayem soil is moderately rapid. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is very high. The hazard of water and wind erosion is severe.

Typical soil descriptions with range in characteristics are included, in alphabetical order, in the section Soil Series and Their Morphology.

Additional Components

Julesburg: 7 percent
Turnercrest: 6 percent
Orpha: 5 percent
Areas with 20-30 percent slope: 2 percent

Use and Management

This unit is used as rangeland and wildlife habitat.

This unit is poorly suited for stockwater ponds. The main limitation is the high potential for seepage losses.

This unit is poorly suited for mechanical range renovation and range seeding. The main limitation for range seeding is the hazard of erosion. Mechanical range renovation may not be economically feasible due to the coarse texture of the surface layer. To reduce the hazard of erosion, adequate residue must be maintained on the surface at all times until the seeding is established. Tilled areas must remain narrow and at right angles to the wind. The low annual precipitation should be considered when planning a seeding.

For general and detailed information about managing this map unit, see the following sections in Part II of this publication: Agronomy, Range, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

166—Jaywest loam, 0 to 6 percent slopes

Setting

Elevation: 4,300 to 4,800 feet
Mean annual precipitation: 15 to 17 inches
Frost-free period: 105 to 130 days

Major Component Description

Jaywest and similar soils

Composition: 80 percent
Landform: Alluvial fan, fan remnant
Landform Element: None assigned
Slope: 0 to 6 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Parent Material: Alluvium derived from calcareous shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
E—0 to 7 inches; loam
Bt—7 to 36 inches; clay
Bk—36 to 60 inches; clay loam

Note: Permeability of the Jaywest soil is slow. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is medium. The hazard of water erosion is slight. The hazard of wind erosion is moderate.

Typical soil descriptions with range in characteristics are included, in alphabetical order, in the section Soil Series and Their Morphology.

Additional Components

Deekay: 5 percent
Gullies: 5 percent
Moorhead: 5 percent
Platmak: 3 percent
Areas of 6-10 percent slopes: 2 percent

Use and Management

This unit is used as rangeland, nonirrigated hayland and pasture, nonirrigated cropland, and wildlife habitat.

This unit is well suited for stockwater ponds and mechanical range renovation and moderately well suited for range seeding. The main limitation is the hazard of wind erosion. To reduce the hazard of wind erosion, adequate residue must be maintained on the surface at all times until the seeding is established. Tilled areas must remain narrow and at right angles to the wind. The low annual precipitation should be considered when planning a seeding.

If this unit is used for nonirrigated hayland and pasture, the main limitation is low annual precipitation. Use of proper stocking rates, pasture rotation, and restricted grazing during wet periods help to keep the pasture in good condition.

If this unit is used for nonirrigated cropland, the main limitations are low annual precipitation and the moderate hazard of water and wind erosion. Because of the low annual precipitation, a crop rotation that most effectively uses soil moisture should be used. Reducing or eliminating tillage operations increases the effective use of soil moisture. Wind erosion can be reduced by planting crops in alternate strips at right angles to the prevailing wind. A tillage pan forms easily if this soil is tilled when wet. Chiseling or subsoiling can be used to break up the tillage pan.

For general and detailed information about managing this map unit, see the following sections in Part II of this publication: Agronomy, Range, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

167—Jaywest-Moorhead loams, 0 to 6 percent slopes

Setting

Elevation: 4,300 to 4,800 feet
Mean annual precipitation: 15 to 17 inches
Frost-free period: 105 to 130 days

Major Component Description

Jaywest and similar soils

Composition: 40 percent
Landform: Alluvial fan, fan remnant
Landform Element: None assigned
Slope: 0 to 6 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Parent Material: Alluvium derived from calcareous shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
E—0 to 7 inches; loam
Bt—7 to 36 inches; clay
Bk—36 to 60 inches; clay loam
Note: Permeability of the Jaywest soil is slow. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is medium. The hazard of water erosion is slight. The hazard of wind erosion is moderate.

Moorhead and similar soils

Composition: 40 percent
Landform: Alluvial fan, fan remnant
Landform Element: None assigned
Slope: 0 to 6 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Parent Material: Alluvium derived from calcareous shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 5 inches; loam
Bt—5 to 35 inches; clay
Bk—35 to 60 inches; clay loam
Note: Permeability of the Moorhead soil is slow. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is medium. The hazard of water erosion is slight to moderate. The hazard of wind erosion is moderate.

Typical soil descriptions with range in characteristics are included, in alphabetical order, in the section Soil Series and Their Morphology.

Additional Components

Deekay: 5 percent
Leiter: 5 percent
Platmak: 5 percent
Spottedhorse: 5 percent

Use and Management

This unit is used as rangeland, hayland and pasture, nonirrigated cropland, and wildlife habitat.

This unit is well suited for stockwater ponds and mechanical range renovation and moderately well suited for range seeding. The main limitation is the hazard of wind erosion. To reduce the hazard of wind erosion, adequate residue must be maintained on the surface at all times until the seeding is established. Tilled areas must remain narrow and at right angles to the wind. The low annual precipitation should be considered when planning a seeding.

If this unit is used for hayland and pasture, the main limitation is low annual precipitation. Use of proper stocking rates, pasture rotation, and restricted grazing during wet periods help to keep the pasture in good condition.

If this unit is used for nonirrigated cropland, the main limitations are low annual precipitation and moderate hazard of water and wind erosion. Because of the low annual precipitation, a crop rotation that most effectively uses soil moisture should be used. Reducing or eliminating tillage operations increases the effective use of soil moisture. Wind erosion can be reduced by planting crops in alternate strips at right angles to the prevailing wind. Crop residue left on or near the surface helps to conserve moisture, maintain tilth, and control water and wind erosion. A tillage pan forms easily if these soils are tilled when wet. Chiseling or subsoiling can be used to break up the tillage pan.

For general and detailed information about managing this map unit, see the following sections in Part II of this publication: Agronomy, Range, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

168—Jaywest-Spottedhorse loams, 0 to 6 percent slopes

Setting

Elevation: 4,300 to 4,800 feet
Mean annual precipitation: 15 to 17 inches
Frost-free period: 105 to 130 days

Major Component Description

Jaywest and similar soils

Composition: 50 percent
Landform: Hill, ridge
Landform Element: Backslope, footslope
Slope: 0 to 6 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Parent Material: Alluvium derived from calcareous shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
E—0 to 7 inches; loam
Bt—7 to 36 inches; clay
Bk—36 to 60 inches; clay loam
Note: Permeability of the Jaywest soil is slow. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is medium. The hazard of water erosion is slight. The hazard of wind erosion is moderate.

Spottedhorse and similar soils

Composition: 30 percent
Landform: Hill, ridge
Landform Element: Summit, shoulder
Slope: 0 to 6 percent
Depth to Restrictive Feature: Bedrock (paralithic): 20 to 40 inches
Drainage Class: Well drained
Parent Material: Alluvium over residuum weathered from calcareous shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
E—0 to 4 inches; loam
Bt—4 to 27 inches; clay
Bk—27 to 35 inches; clay loam
Cr—35 to 60 inches; bedrock
Note: Permeability of the Spottedhorse soil is slow. Available water capacity is moderate. Effective rooting depth is 20 to 40 inches. Runoff is medium. The hazard of water erosion is slight. The hazard of wind erosion is moderate.

Typical soil descriptions with range in characteristics are included, in alphabetical order, in the section Soil Series and Their Morphology.

Additional Components

Deekay: 7 percent
Moorhead: 7 percent
Oldwolf: 6 percent

Use and Management

This unit is used as rangeland, nonirrigated hayland and pasture, and wildlife habitat.

The Jaywest soil is well suited and the Spottedhorse soil is poorly suited for stockwater ponds. The main limitation is depth to bedrock.

This unit is well suited for mechanical range renovation and moderately well suited for range seeding. The main limitation is the hazard of wind erosion. To reduce the hazard of wind erosion, adequate residue must be maintained on the surface at all times until the seeding is established. Tilled areas must remain narrow and at right angles to the wind. The low annual precipitation should be considered when planning a seeding.

If this unit is used for nonirrigated hayland and pasture, the main limitation is low annual precipitation. Use of proper stocking rates, pasture rotation, and restricted grazing during wet periods help to keep the pasture in good condition.

For general and detailed information about managing this map unit, see the following sections in Part II of this publication: Agronomy, Range, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

169—Julesburg fine sandy loam, 0 to 6 percent slopes

Setting

Elevation: 4,200 to 5,000 feet
Mean annual precipitation: 14 to 17 inches
Frost-free period: 105 to 130 days

Major Component Description

Julesburg and similar soils

Composition: 85 percent
Landform: Alluvial fan, fan remnant
Landform Element: None assigned
Slope: 0 to 6 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Parent Material: Alluvium and/or eolian deposits derived from calcareous sandstone
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 10 inches; fine sandy loam
Bt—10 to 32 inches; fine sandy loam
C—32 to 60 inches; fine sandy loam
Note: Permeability of the Julesburg soil is moderately rapid. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is low. The hazard of water erosion is slight. The hazard of wind erosion is severe.

Typical soil descriptions with range in characteristics are included, in alphabetical order, in the section Soil Series and Their Morphology.

Additional Components

Decolney: 5 percent
Moskee: 5 percent
Vonalf: 5 percent

Use and Management

This unit is used as rangeland, nonirrigated hayland and pasture, and wildlife habitat.

This unit is poorly suited for stockwater ponds. The main limitation is the high potential for seepage losses.

This unit is poorly suited for mechanical range renovation and moderately well suited for range seeding. The main limitation for range seeding is the hazard of wind erosion. Mechanical range renovation may not be economically feasible due to the coarse texture of the surface layer. To reduce the hazard of wind erosion, adequate residue must be maintained on the surface at all times until the seeding is established. Tilled areas must remain narrow and at right angles to the wind. The low annual precipitation should be considered when planning a seeding.

If this unit is used for nonirrigated hayland and pasture, the main limitation is low annual precipitation. Use of proper stocking rates, pasture rotation, and restricted grazing during wet periods help to keep the pasture in good condition.

For general and detailed information about managing this map unit, see the following sections in Part II of this publication: Agronomy, Range, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

170—Keeline-Tullock loamy sands, 6 to 30 percent slopes

Setting

Elevation: 4,100 to 5,200 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 105 to 130 days

Major Component Description

Keeline and similar soils

Composition: 40 percent
Landform: Hill, ridge
Landform Element: Backslope, footslope
Slope: 6 to 20 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Parent Material: Alluvium and/or eolian deposits derived from calcareous sandstone
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 6 inches; loamy sand
C—6 to 60 inches; fine sandy loam
Note: Permeability of the Keeline soil is moderately rapid. Available water capacity is very low. Effective rooting depth is 60 inches or more. Runoff is low. The hazard of water erosion is moderate. The hazard of wind erosion is severe.

Tullock and similar soils

Composition: 40 percent
Landform: Hill, ridge
Landform Element: Summit, shoulder
Slope: 6 to 30 percent
Depth to Restrictive Feature: Bedrock (paralithic): 20 to 40 inches
Drainage Class: Excessively drained

Parent Material: Alluvium and/or eolian deposits over residuum weathered from calcareous sandstone
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 4 inches; loamy sand
C—4 to 28 inches; loamy sand
Cr—28 to 60 inches; bedrock
Note: Permeability of the Tullock soil is rapid. Available water capacity is very low. Effective rooting depth is 20 to 40 inches. Runoff is very low. The hazard of water erosion is slight. The hazard of wind erosion is severe.

Typical soil descriptions with range in characteristics are included, in alphabetical order, in the section Soil Series and Their Morphology.

Additional Components

Orpha: 5 percent
Terro: 5 percent
Taluce: 4 percent
Vonalee: 3 percent
Badland: 2 percent
Blowouts: 1 percent

Use and Management

This unit is used as rangeland and wildlife habitat.

This unit is poorly suited for stockwater ponds. The main limitation is the high potential for seepage losses. The depth to bedrock within the Tullock soil is also a limitation.

This unit is poorly suited for mechanical range renovation and moderately well suited for range seeding. The main limitation for range seeding is the hazard of erosion. Mechanical range renovation may not be economically feasible due to the coarse texture of the surface layer. To reduce the hazard of erosion, adequate residue must be maintained on the surface at all times until the seeding is established. The low annual precipitation should be considered when planning a seeding.

For general and detailed information about managing this map unit, see the following sections in Part II of this publication: Agronomy, Range, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

171—Keeline-Tullock-Niobrara, dry complex, 3 to 30 percent slopes

Setting

Elevation: 4,100 to 5,200 feet
Mean annual precipitation: 10 to 17 inches
Frost-free period: 105 to 130 days

Major Component Description

Keeline and similar soils

Composition: 30 percent
Landform: Hill, ridge
Landform Element: Backslope, footslope
Slope: 3 to 15 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Parent Material: Alluvium and/or eolian deposits derived from calcareous sandstone
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 4 inches; sandy loam
C—4 to 60 inches; sandy loam
Note: Permeability of the Keeline soil is moderately rapid. Available water capacity is moderate. Effective rooting depth is 60 inches or more. Runoff is low. The hazard of water erosion is moderate. The hazard of wind erosion is severe.

Tullock and similar soils

Composition: 25 percent
Landform: Hill, ridge
Landform Element: Summit, shoulder
Slope: 3 to 30 percent
Depth to Restrictive Feature: Bedrock (paralithic): 20 to 40 inches
Drainage Class: Excessively drained
Parent Material: Alluvium and/or eolian deposits over residuum weathered from calcareous sandstone
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 4 inches; loamy sand
C—4 to 22 inches; loamy sand
Cr—22 to 60 inches; bedrock

Note: Permeability of the Tullock soil is rapid. Available water capacity is very low. Effective rooting depth is 20 to 40 inches. Runoff is very low. The hazard of water and wind erosion is severe.

Niobrara and similar soils

Composition: 20 percent
Landform: Hill, ridge
Landform Element: Summit, shoulder
Slope: 3 to 30 percent
Depth to Restrictive Feature: Bedrock (paralithic): 10 to 20 inches
Drainage Class: Excessively drained
Parent Material: Residuum weathered from sandstone
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 3 inches; loamy sand
C—3 to 12 inches; sand
Cr—12 to 60 inches; bedrock
Note: Permeability of the Niobrara soil is rapid. Available water capacity is very low. Effective rooting depth is 10 to 20 inches. Runoff is medium. The hazard of water and wind erosion is severe.

Typical soil descriptions with range in characteristics are included, in alphabetical order, in the section Soil Series and Their Morphology.

Additional Components

Turnercrest: 9 percent
Orpha: 8 percent
Badland: 7 percent
Blowouts: 1 percent

Use and Management

This unit is used as rangeland and wildlife habitat.

This unit is poorly suited for stockwater ponds. The main limitations are the depth to bedrock within the Tullock and Niobrara soils and the high potential of all the soils for seepage losses.

This unit is poorly suited for mechanical range renovation and range seeding. The main limitation for range seeding is the hazard of water and wind erosion. Mechanical range renovation may not be economically feasible due to the coarse texture of the surface layer.

For general and detailed information about managing this map unit, see the following sections in Part II of this publication: Agronomy, Range, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

172—Keyner fine sandy loam, 0 to 6 percent slopes

Setting

Elevation: 4,100 to 5,000 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 105 to 130 days

Major Component Description

Keyner and similar soils

Composition: 80 percent
Landform: Alluvial fan, fan remnant
Landform Element: None assigned
Slope: 0 to 6 percent
Depth to Restrictive Feature: Natric: 12 inches
Drainage Class: Well drained
Parent Material: Alluvium derived from sandstone and shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Salt Affected: Saline within 12 inches
Sodium Affected: Sodic within 12 inches
Typical profile:
E—0 to 4 inches; fine sandy loam
Bt—4 to 12 inches; clay loam
Btn—12 to 20 inches; sandy clay loam
Btkn—20 to 26 inches; sandy clay loam
Bkn—26 to 60 inches; sandy clay loam
Note: Permeability of the Keyner soil is slow. Available water capacity is high. Effective rooting depth is 60 inches or more for salt-tolerant plants. Runoff is medium. The hazard of water erosion is slight. The hazard of wind erosion is severe.

Typical soil descriptions with range in characteristics are included, in alphabetical order, in the section Soil Series and Their Morphology.

Additional Components

Arvada, thick surface: 5 percent
Emigha, sodic: 5 percent
Forkwood: 5 percent
Zigweid: 5 percent

Use and Management

This unit is used primarily as rangeland and wildlife habitat.

This unit is well suited for stockwater ponds.

This unit is poorly suited for mechanical range renovation and range seeding. The main limitation is the salinity and alkalinity of the subsoil. The hazard of wind erosion is also a concern for range seeding. Mechanical range renovation may not be economically feasible due to the coarse texture of the surface layer. If range seeding is conducted, seeding rates may need to be increased and plant species carefully selected because of the salinity and alkalinity of the subsoil. To reduce the hazard of wind erosion, adequate residue must be maintained on the surface at all times until the seeding is established. Tilled areas must remain narrow and at right angles to the wind. The low annual precipitation should be considered when planning a seeding.

For general and detailed information about managing this map unit, see the following sections in Part II of this publication: Agronomy, Range, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

173—Lawver-Teckla-Wibaux complex, 0 to 6 percent slopes

Setting

Elevation: 4,400 to 5,200 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 105 to 130 days

Major Component Description

Lawver and similar soils

Composition: 30 percent
Landform: Mesa, terrace
Landform Element: Summit, shoulder
Slope: 0 to 6 percent
Depth to Restrictive Feature: Strongly contrasting textural stratification: 20 to 40 inches
Drainage Class: Well drained
Parent Material: Alluvium and/or eolian deposits over residuum weathered from porcelanite
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
E—0 to 4 inches; loam
Bt—4 to 20 inches; clay loam
2Btk—20 to 27 inches; channery clay loam
2Bk—27 to 38 inches; very channery clay loam
3C—38 to 60 inches; extremely channery sandy loam
Note: Permeability of the Lawver soil is slow in the subsoil and rapid in the substratum. Available water capacity is moderate. Effective rooting depth is 60 inches or more. Runoff is medium. The hazard of water erosion is slight. The hazard of wind erosion is moderate.

Teckla and similar soils

Composition: 30 percent
Landform: Mesa, terrace
Landform Element: Summit, shoulder
Slope: 0 to 6 percent
Depth to Restrictive Feature: Strongly contrasting textural stratification: 20 to 40 inches
Drainage Class: Well drained
Parent Material: Alluvium and/or eolian deposits over residuum weathered from porcelanite
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 10 inches; very fine sandy loam
Bt—10 to 23 inches; sandy clay loam
2Bt—23 to 31 inches; channery loam
2Bk—31 to 45 inches; very channery loam
3C—45 to 60 inches; extremely channery sandy loam
Note: Permeability of the Teckla soil is moderate in the upper part and rapid in the substratum. Available water capacity is moderate. Effective rooting depth is 60 inches or more. Runoff is low. The hazard of water erosion is slight. The hazard of wind erosion is severe.

Wibaux and similar soils

Composition: 20 percent
Landform: Hill, ridge
Landform Element: Summit, shoulder
Slope: 0 to 6 percent
Depth to Restrictive Feature: Strongly contrasting textural stratification: 10 to 20 inches
Drainage Class: Well drained
Parent Material: Alluvium and/or colluvium over residuum weathered from porcelanite
Flooding: None

Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 3 inches; very channery loam
C—3 to 13 inches; very channery loam
2C—13 to 60 inches; fragmental material
Note: Permeability of the Wibaux soil is moderately rapid in the surface and very rapid in the underlying material. Available water capacity is very low. Effective rooting depth is variable due to the fractured nature of the porcelanite. Runoff is very low. The hazard of water and wind erosion is slight.

Typical soil descriptions with range in characteristics are included, in alphabetical order, in the section Soil Series and Their Morphology.

Additional Components

Lawver-like: 7 percent
Teckla-like: 7 percent
Areas with 6-10 percent slopes: 6 percent

Use and Management

This unit is used as rangeland and wildlife habitat.

This unit is poorly suited for stockwater ponds. The main limitation is the high potential for seepage losses.

The Lawver soil is well suited for mechanical range renovation and moderately well suited for range seeding. The main limitation for range seeding is the hazard of wind erosion. The Wibaux soil is poorly suited for mechanical range renovation and range seeding. The main limitation is the high amount of rock fragments in the surface layer. The Teckla soil is moderately well suited for mechanical range renovation and range seeding. Mechanical range renovation may not be economically feasible on the Teckla soil due to the coarse texture of the surface layer. To reduce the hazard of wind erosion, adequate residue must be maintained on the surface at all times until the seeding is established. Tilled areas must remain narrow and at right angles to the wind. The low annual precipitation should be considered when planning a seeding.

For general and detailed information about managing this map unit, see the following sections in Part II of this publication: Agronomy, Range, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

174—Brislawn-Rockybutte-Ironbutte complex, 0 to 10 percent slopes

Setting

Elevation: 4,100 to 4,800 feet
Mean annual precipitation: 15 to 17 inches
Frost-free period: 105 to 130 days

Major Component Description

Brislawn and similar soils

Composition: 30 percent
Landform: Plateau, ridge
Landform Element: Summit, shoulder
Slope: 0 to 6 percent
Depth to Restrictive Feature: Strongly contrasting textural stratification: 20 to 40 inches
Drainage Class: Well drained
Parent Material: Alluvium and/or eolian deposits over residuum weathered from porcelanite
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
E—0 to 6 inches; loam
Bt—6 to 21 inches; clay
2Btk—21 to 31 inches; channery clay loam
2Bk—31 to 37 inches; very channery clay loam
3C—37 to 60 inches; fragmental material
Note: Permeability of the Brislawn soil is slow in the subsoil and very rapid in the substratum. Available water capacity is moderate. Effective rooting depth is 60 inches or more. Runoff is medium. The hazard of water erosion is slight. The hazard of wind erosion is moderate.

Rockybutte and similar soils

Composition: 30 percent
Landform: Plateau, ridge
Landform Element: Summit, shoulder
Slope: 0 to 6 percent
Depth to Restrictive Feature: Strongly contrasting textural stratification: 20 to 40 inches
Drainage Class: Well drained
Parent Material: Alluvium and/or eolian deposits over residuum weathered from porcelanite
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None

Typical profile:
A—0 to 5 inches; loam
Bt—5 to 23 inches; clay loam
2Bk—23 to 38 inches; extremely channery loam
3C—38 to 60 inches; fragmental material
Note: Permeability of the Rockybutte soil is moderate in the surface and very rapid in the underlying material. Available water capacity is very low. Effective rooting depth is variable due to the fractured nature of the porcelanite. Runoff is low. The hazard of water and wind erosion is slight.

Ironbutte and similar soils

Composition: 20 percent
Landform: Ridge
Landform Element: Summit, shoulder
Slope: 0 to 10 percent
Depth to Restrictive Feature: Strongly contrasting textural stratification: 10 to 20 inches
Drainage Class: Well drained
Parent Material: Alluvium and/or colluvium derived from porcelanite
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 4 inches; channery loam
C—4 to 12 inches; very channery loam
2C—12 to 60 inches; fragmental material
Note: Permeability of the Ironbutte soil is moderate in the surface soil and very rapid in the underlying material. Available water capacity is very low. Effective rooting depth is variable due to the fractured nature of the porcelanite. Runoff is very low. The hazard of water and wind erosion is slight.

Typical soil descriptions with range in characteristics are included, in alphabetical order, in the section Soil Series and Their Morphology.

Additional Components

Brislawn-like: 10 percent
Sandy soils: 10 percent

Use and Management

This unit is used as rangeland and wildlife habitat.

This unit is poorly suited for stockwater ponds. The main limitation is the high potential for seepage losses.

The Brislawn and Rockybutte soils are well suited for mechanical range renovation and moderately well suited for range seeding. The main limitation for range seeding is the hazard of wind erosion. To reduce the hazard of wind erosion, adequate residue must be maintained on the surface at all times until the seeding is established. Tilled areas must remain narrow and at right angles to the wind. The Ironbutte soil is poorly suited for mechanical range renovation and range seeding. The main limitation is the high amount of rock fragments in the surface layer. The low annual precipitation should be considered when planning a seeding.

For general and detailed information about managing this map unit, see the following sections in Part II of this publication: Agronomy, Range, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

175—Lawver-Wibaux complex, 6 to 30 percent slopes

Setting

Elevation: 4,200 to 5,100 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 105 to 130 days

Major Component Description

Lawver and similar soils

Composition: 40 percent
Landform: Terrace
Landform Element: None assigned
Slope: 6 to 15 percent
Depth to Restrictive Feature: Strongly contrasting textural stratification: 20 to 40 inches
Drainage Class: Well drained
Parent Material: Alluvium and/or eolian deposits over residuum weathered from porcelanite
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
E—0 to 4 inches; loam
Bt—4 to 20 inches; clay loam
2Btk—20 to 27 inches; channery clay loam
2Bk—27 to 38 inches; very channery clay loam
3C—38 to 60 inches; extremely channery sandy loam
Note: Permeability of the Lawver soil is slow in the subsoil and rapid in the substratum.

Available water capacity is very low. Effective rooting depth is 60 inches or more. Runoff is high. The hazard of water erosion is severe. The hazard of wind erosion is moderate.

Wibaux and similar soils

Composition: 40 percent
Landform: Hill, ridge
Landform Element: None assigned
Slope: 6 to 30 percent
Depth to Restrictive Feature: Strongly contrasting textural stratification: 10 to 20 inches
Drainage Class: Well drained
Parent Material: Alluvium and/or colluvium over residuum weathered from porcelanite
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 3 inches; very channery loam
C—3 to 13 inches; very channery loam
2C—13 to 60 inches; fragmental material
Note: Permeability of the Wibaux soil is moderate in the surface and very rapid in the underlying material. Available water capacity is very low. Effective rooting depth is variable due to the fractured nature of the porcelanite. Runoff is low. The hazard of water and wind erosion is slight.

Typical soil descriptions with range in characteristics are included, in alphabetical order, in the section Soil Series and Their Morphology.

Additional Components

Teckla: 7 percent
Wibaux, thin solum: 7 percent
Badland: 6 percent

Use and Management

This unit is used as rangeland and wildlife habitat.

This unit is poorly suited for stockwater ponds. The main limitations are the high potential for seepage losses and slope.

The Lawver soil is moderately well suited for mechanical range renovation and range seeding. The main limitations are slope and the hazard of water erosion. To reduce the hazard of erosion, adequate residue must be maintained on the surface at all times until the seeding is established. If practical, renovation and tillage for seeding should be along the contour of the slope. The Wibaux soil is poorly suited for mechanical range renovation and range seeding. The main limitations are the high amount of rock fragments in the surface layer and slope. The low annual precipitation should be considered when planning a seeding.

For general and detailed information about managing this map unit, see the following sections in Part II of this publication: Agronomy, Range, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

176—Leiter-Cromack clay loams, 3 to 15 percent slopes

Setting

Elevation: 4,300 to 4,800 feet
Mean annual precipitation: 15 to 17 inches
Frost-free period: 105 to 130 days

Major Component Description

Leiter and similar soils

Composition: 50 percent
Landform: Hill, ridge
Landform Element: Backslope, summit
Slope: 3 to 15 percent
Depth to Restrictive Feature: Bedrock (paralithic): 20 to 40 inches
Drainage Class: Well drained
Parent Material: Alluvium over residuum weathered from calcareous shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 3 inches; clay loam
Bt—3 to 22 inches; clay
Bk—22 to 33 inches; clay loam
Cr—33 to 60 inches; bedrock
Note: Permeability of the Leiter soil is slow. Available water capacity is moderate. Effective rooting depth is 20 to 40 inches. Runoff is high. The hazard of water erosion is severe. The hazard of wind erosion is moderate.

Cromack and similar soils

Composition: 30 percent
Landform: Hill, ridge
Landform Element: Summit, shoulder
Slope: 3 to 15 percent

Depth to Restrictive Feature: Bedrock (paralithic): 20 to 40 inches
Drainage Class: Well drained
Parent Material: Alluvium over residuum weathered from calcareous shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 6 inches; clay loam
Bw—6 to 14 inches; clay
Bk—14 to 29 inches; clay
Cr—29 to 60 inches; bedrock
Note: Permeability of the Cromack soil is slow. Available water capacity is low. Effective rooting depth is 20 to 40 inches. Runoff is high. The hazard of water and wind erosion is moderate.

Typical soil descriptions with range in characteristics are included, in alphabetical order, in the section Soil Series and Their Morphology.

Additional Components

Fairburn: 5 percent
Samsil: 5 percent
Moorhead: 4 percent
Ucross: 4 percent
Areas with 0-3 percent slope: 2 percent

Use and Management

This unit is used as rangeland and wildlife habitat.

This unit is poorly suited for stockwater ponds. The main limitation is depth to bedrock.

This unit is well suited for mechanical range renovation and moderately well suited for range seeding. The main limitation is the hazard of water and wind erosion. To reduce the hazard of erosion, adequate residue must be maintained on the surface at all times until the seeding is established. Tilled areas must remain narrow and at right angles to the wind. If practical, renovation and tillage for seeding should be along the contour of the slope. The low annual precipitation should be considered when planning a seeding.

For general and detailed information about managing this map unit, see the following sections in Part II of this publication: Agronomy, Range, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

177—Maysdorf fine sandy loam, 0 to 6 percent slopes

Setting

Elevation: 4,100 to 5,100 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 105 to 130 days

Major Component Description

Maysdorf and similar soils

Composition: 75 percent
Landform: Alluvial fan, fan remnant
Landform Element: None assigned
Slope: 0 to 6 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Parent Material: Alluvium and/or eolian deposits derived from calcareous sandstone
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 3 inches; fine sandy loam
Bt—3 to 33 inches; sandy clay loam
Bk—33 to 60 inches; fine sandy loam
Note: Permeability of the Maysdorf soil is moderate. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is low. The hazard of water erosion is slight. The hazard of wind erosion is severe.

Typical soil descriptions with range in characteristics are included, in alphabetical order, in the section Soil Series and Their Morphology.

Additional Components

Decolney: 7 percent
Hiland: 5 percent
Forkwood: 4 percent
Moskee: 3 percent
Pugsley: 3 percent
Vonalee: 3 percent

Use and Management

This unit is used as rangeland, nonirrigated hayland and pasture, and wildlife habitat.

This unit is poorly suited for stockwater ponds. The main limitation is the high potential for seepage losses.

This unit is moderately well suited for mechanical range renovation and range seeding. The main limitation for range seeding is the hazard of wind erosion. Mechanical range renovation may not be economically feasible due to the coarse texture of the surface layer. To reduce the hazard of wind erosion, adequate residue must be maintained on the surface at all times until the seeding is established. Tilled areas must remain narrow and at right angles to the wind. The low annual precipitation should be considered when planning a seeding.

This unit is moderately well suited for nonirrigated hayland and pasture. The main limitation is low annual precipitation. Rotation grazing maintains optimum vigor and quality of forage.

For general and detailed information about managing this map unit, see the following sections in Part II of this publication: Agronomy, Range, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

178—Maysdorf sandy clay loam, 0 to 6 percent slopes

Setting

Elevation: 4,100 to 5,000 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 105 to 130 days

Major Component Description

Maysdorf and similar soils

Composition: 75 percent
Landform: Alluvial fan, fan remnant
Landform Element: None assigned
Slope: 0 to 6 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Parent Material: Alluvium and/or eolian deposits derived from calcareous sandstone
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 5 inches; sandy clay loam
Bt—5 to 26 inches; sandy clay loam
Bk—26 to 60 inches; fine sandy loam
Note: Permeability of the Maysdorf soil is moderate. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is low. The hazard of water erosion is slight. The hazard of wind erosion is moderate.

Typical soil descriptions with range in characteristics are included, in alphabetical order, in the section Soil Series and Their Morphology.

Additional Components

Decolney: 7 percent
Hiland: 5 percent
Forkwood: 4 percent
Moskee: 3 percent
Pugsley: 3 percent
Vonalee: 3 percent

Use and Management

This unit is used primarily as rangeland and wildlife habitat.

This unit is poorly suited for stockwater ponds. The main limitation is the high potential for seepage losses.

This unit is moderately well suited for mechanical range renovation and range seeding. The main limitation for range seeding is the hazard of wind erosion. To reduce the hazard of wind erosion, adequate residue must be maintained on the surface at all times until the seeding is established. Tilled areas must remain narrow and at right angles to the wind. The low annual precipitation should be considered when planning a seeding.

For general and detailed information about managing this map unit, see the following sections in Part II of this publication: Agronomy, Range, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

179—Maysdorf-Pugsley sandy loams, 0 to 6 percent slopes

Setting

Elevation: 4,200 to 5,100 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 105 to 130 days

Major Component Description

Maysdorf and similar soils

Composition: 50 percent
Landform: Hill, ridge
Landform Element: Backslope, footslope
Slope: 0 to 6 percent

Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Parent Material: Alluvium and/or eolian deposits derived from calcareous sandstone
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 5 inches; sandy loam
Bt—5 to 20 inches; sandy clay loam
Bk—20 to 60 inches; fine sandy loam
Note: Permeability of the Maysdorf soil is moderate. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is low. The hazard of water erosion is slight. The hazard of wind erosion is severe.

Pugsley and similar soils

Composition: 30 percent
Landform: Hill, ridge
Landform Element: Summit, shoulder
Slope: 0 to 6 percent
Depth to Restrictive Feature: Bedrock (paralithic): 20 to 40 inches
Drainage Class: Well drained
Parent Material: Eolian deposits over residuum weathered from calcareous sandstone
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 4 inches; sandy loam
Bt—4 to 15 inches; sandy clay loam
C—15 to 23 inches; fine sandy loam
Cr—23 to 60 inches; bedrock
Note: Permeability of the Pugsley soil is moderate. Available water capacity is very low. Effective rooting depth is 20 to 40 inches. Runoff is low. The hazard of water erosion is slight. The hazard of wind erosion is severe.

Typical soil descriptions with range in characteristics are included, in alphabetical order, in the section Soil Series and Their Morphology.

Additional Components

Bowbac: 4 percent
Cushman: 4 percent
Decolney: 4 percent
Forkwood: 4 percent
Hiland: 4 percent

Use and Management

This unit is used primarily as rangeland and wildlife habitat.

This unit is poorly suited for stockwater ponds. The main limitations are the depth to bedrock within the Pugsley soil and the high potential for seepage losses of all soils.

This unit is moderately well suited for mechanical range renovation and range seeding. The main limitation for range seeding is the hazard of wind erosion. Mechanical range renovation may not be economically feasible due to the coarse texture of the surface layer. To reduce the hazard of wind erosion, adequate residue must be maintained on the surface at all times until the seeding is established. Tilled areas must remain narrow and at right angles to the wind. The low annual precipitation should be considered when planning a seeding.

For general and detailed information about managing this map unit, see the following sections in Part II of this publication: Agronomy, Range, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

180—Maysdorf-Pugsley sandy loams, 6 to 15 percent slopes

Setting

Elevation: 4,100 to 5,000 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 105 to 130 days

Major Component Description

Maysdorf and similar soils

Composition: 50 percent
Landform: Hill, Ridge
Landform Element: Backslope, footslope
Slope: 6 to 15 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Parent Material: Alluvium and/or eolian deposits derived from calcareous sandstone
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 5 inches; sandy loam

Bt—5 to 20 inches; sandy clay loam
Bk—20 to 60 inches; fine sandy loam
Note: Permeability of the Maysdorf soil is moderate. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is medium. The hazard of water and wind erosion is severe.

Pugsley and similar soils

Composition: 30 percent
Landform: Hill, ridge
Landform Element: Summit, shoulder
Slope: 6 to 15 percent
Depth to Restrictive Feature: Bedrock (paralithic): 20 to 40 inches
Drainage Class: Well drained
Parent Material: Eolian deposits over residuum weathered from calcareous sandstone
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 4 inches; sandy loam
Bt—4 to 15 inches; sandy clay loam
C—15 to 23 inches; fine sandy loam
Cr—23 to 60 inches; bedrock
Note: Permeability of the Pugsley soil is moderate. Available water capacity is very low. Effective rooting depth is 20 to 40 inches. Runoff is medium. The hazard of water and wind erosion is severe.

Typical soil descriptions with range in characteristics are included, in alphabetical order, in the section Soils Series and Their Morphology.

Additional Components

Bowbac: 5 percent
Decolney: 5 percent
Hiland: 5 percent
Vonalee: 5 percent

Use and Management

This unit is used as rangeland and wildlife habitat.

This unit is poorly suited for stockwater ponds. The main limitations are the depth to bedrock within the Pugsley soil and the high potential for seepage losses on both soils.

This unit is moderately well suited for mechanical range renovation and range seeding. Mechanical range renovation may not be economically feasible due to the coarse texture of the surface layer. The main limitation for range seeding is the hazard of water and wind erosion. To reduce the hazard of erosion, adequate residue must be maintained on the surface at all times until the seeding is established. Tilled areas must remain narrow and at right angles to the wind. The low annual precipitation should be considered when planning a seeding.

For general and detailed information about managing this map unit, see the following sections in Part II of this publication: Agronomy, Range, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

181—Moorhead clay loam, 0 to 6 percent slopes

Setting

Elevation: 4,300 to 4,800 feet
Mean annual precipitation: 15 to 17 inches
Frost-free period: 105 to 130 days

Major Component Description

Moorhead and similar soils

Composition: 80 percent
Landform: Alluvial fan, fan remnant
Landform Element: None assigned
Slope: 0 to 6 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Parent Material: Alluvium derived from calcareous shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 4 inches; clay loam
Bt—4 to 24 inches; clay
Bk—24 to 60 inches; clay loam
Note: Permeability of the Moorhead soil is slow. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is medium. The hazard of water and wind erosion is moderate.

Typical soil descriptions with range in characteristics are included, in alphabetical order, in the section Soils Series and Their Morphology.

Additional Components

Deekay: 5 percent
Echeta: 5 percent
Felix, ponded: 5 percent
Jaywest: 5 percent

Use and Management

This unit is used as rangeland, nonirrigated hayland and pasture, nonirrigated cropland, and wildlife habitat. Some areas are also used for homesite and urban development.

This unit is well suited for stockwater ponds, mechanical range renovation, and range seeding. To reduce the hazard of erosion, adequate residue must be maintained on the surface at all times until the seeding is established. Tilled areas must remain narrow and at right angles to the wind. The low annual precipitation should be considered when planning a seeding.

This unit is moderately well suited for nonirrigated hayland and pasture. The main limitation is the low annual precipitation. Proper stocking rates, pasture rotation, and restricted grazing during wet periods help to keep the pasture in good condition.

This unit is moderately well suited for nonirrigated cropland. The main limitations are low annual precipitation and the hazard of water and wind erosion. Because of the low annual precipitation, a crop rotation that most effectively uses soil moisture should be used. Reducing or eliminating tillage operations increases the effective use of soil moisture. Returning crop residue to the soil or regularly adding other organic matter improves fertility, reduces crusting, and increases the water intake rate. This helps to reduce runoff and the hazard of water erosion. Wind erosion can be controlled by keeping the soil rough and cloddy when it is not protected by vegetation. A tillage pan forms easily if this soil is tilled when wet. Chiseling or subsoiling can be used to break up the tillage pan.

This unit is moderately suited for urban development. The main limitations are moderate shrink-swell potential and low strength. The effects of shrinking and swelling can be minimized by using proper engineering designs and by backfilling with material that has low shrink-swell potential. Buildings and roads should be designed to offset the limited ability of this soil to support a load.

For general and detailed information about managing this map unit, see the following sections in Part II of this publication: Agronomy, Range, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

182—Moorhead loam, 0 to 6 percent slopes

Setting

Elevation: 4,300 to 4,800 feet
Mean annual precipitation: 15 to 17 inches
Frost-free period: 105 to 130 days

Major Component Description

Moorhead and similar soils

Composition: 85 percent
Landform: Alluvial fan, fan remnant
Landform Element: None assigned
Slope: 0 to 6 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Parent Material: Alluvium derived from calcareous shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 3 inches; loam
Bt—3 to 25 inches; clay loam
Bk—25 to 60 inches; clay loam
Note: Permeability of the Moorhead soil is moderately slow. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is medium. The hazard of water erosion is slight. The hazard of wind erosion is moderate.

Typical soil descriptions with range in characteristics are included, in alphabetical order, in the section Soil Series and Their Morphology.

Additional Components

Deekay: 5 percent
Felix, ponded: 5 percent
Jaywest: 5 percent

Use and Management

This unit is used as rangeland, nonirrigated hayland and pasture, nonirrigated cropland, and wildlife habitat. A few areas are also used for homesite and urban development.

This soil is well suited for stockwater ponds, mechanical range renovation, and range seeding. To reduce the hazard of erosion, adequate residue must be maintained on the surface at all times until the seeding is established. Tilled areas must remain narrow and at right angles to the wind. The low annual precipitation should be considered when planning a seeding.

This unit is moderately well suited for nonirrigated hayland and pasture. The main limitation is low annual precipitation. Proper stocking rates, pasture rotation, and restricted grazing during wet periods help to keep the pasture in good condition.

This unit is moderately well suited for nonirrigated cropland. The main limitations are low annual precipitation and the hazard of wind erosion. Because of the low annual precipitation, a crop rotation that most effectively uses soil moisture should be used. Reducing or eliminating tillage operations increases the effective use of soil moisture. Returning crop residue to the soil or regularly adding other organic matter improves fertility, reduces crusting, increases the water intake rate, and helps reduce runoff and the hazard of water erosion. Wind erosion can be controlled by keeping the soil rough and cloddy when it is not protected by vegetation. A tillage pan forms easily if this soil is tilled when wet. Chiseling or subsoiling can be used to break up the tillage pan.

This unit is moderately well suited for urban development. The main limitations are moderate shrink-swell potential and low strength. The effects of shrinking and swelling can be minimized by using proper engineering designs and by backfilling with material that has low shrink-swell potential. Buildings and roads should be designed to offset the limited ability of this soil to support a load.

For general and detailed information about managing this map unit, see the following sections in Part II of this publication: Agronomy, Range, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

183—Moorhead-Leiter clay loams, 0 to 6 percent slopes

Setting

Elevation: 4,300 to 4,800 feet
Mean annual precipitation: 15 to 17 inches
Frost-free period: 105 to 130 days

Major Component Description

Moorhead and similar soils

Composition: 50 percent
Landform: Hill, ridge
Landform Element: Backslope, footslope
Slope: 0 to 6 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Parent Material: Alluvium derived from calcareous shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 4 inches; clay loam
Bt—4 to 24 inches; clay
Bk—24 to 60 inches; clay loam
Note: Permeability of the Moorhead soil is slow. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is medium. The hazard of water and wind erosion is moderate.

Leiter and similar soils

Composition: 30 percent
Landform: Hill, ridge
Landform Element: Summit, shoulder
Slope: 0 to 6 percent
Depth to Restrictive Feature: Bedrock (paralithic): 20 to 40 inches
Drainage Class: Well drained
Parent Material: Alluvium over residuum weathered from calcareous shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 3 inches; clay loam
Bt—3 to 22 inches; clay
Bk—22 to 33 inches; clay loam
Cr—33 to 60 inches; bedrock
Note: Permeability of the Leiter soil is slow. Available water capacity is moderate. Effective rooting depth is 20 to 40 inches. Runoff is medium. The hazard of water and wind erosion is moderate.

Typical soil descriptions with range in characteristics are included, in alphabetical order, in the section Soil Series and Their Morphology.

Additional Components

Cromack: 4 percent
Deekay: 4 percent
Echeta: 4 percent
Jaywest: 4 percent
Spottedhorse: 4 percent

Use and Management

This unit is used as rangeland, nonirrigated hayland and pasture, and wildlife habitat.

The Moorhead soil is well suited for stockwater ponds. The Leiter soil is poorly suited. The main limitation is depth to bedrock.

This unit is well suited for mechanical range renovation and moderately well suited for range seeding. The main limitation is the hazard of erosion. To reduce the hazard of erosion, adequate residue must be maintained on the surface at all times until the seeding is established. Tilled areas must remain narrow and at right angles to the wind. The low annual precipitation should be considered when planning a seeding.

This unit is moderately well suited for nonirrigated hayland and pasture. The main limitation is low annual precipitation. Proper stocking rates, pasture rotation, and restricted grazing during wet periods help to keep the pasture in good condition.

For general and detailed information about managing this map unit, see the following sections in Part II of this publication: Agronomy, Range, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

184—Moorhead-Leiter clay loams, 6 to 15 percent slopes

Setting

Elevation: 4,300 to 4,800 feet
Mean annual precipitation: 15 to 17 inches
Frost-free period: 105 to 130 days

Major Component Description

Moorhead and similar soils

Composition: 45 percent
Landform: Hill, ridge
Landform Element: Backslope, footslope
Slope: 6 to 15 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Parent Material: Alluvium derived from calcareous shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 4 inches; clay loam
Bt—4 to 24 inches; clay
Bk—24 to 60 inches; clay loam
Note: Permeability of the Moorhead soil is slow. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is high. The hazard of water erosion is severe. The hazard of wind erosion is moderate.

Leiter and similar soils

Composition: 35 percent
Landform: Hill, ridge
Landform Element: Summit, shoulder
Slope: 6 to 15 percent
Depth to Restrictive Feature: Bedrock (paralithic): 20 to 40 inches
Drainage Class: Well drained
Parent Material: Alluvium over residuum weathered from calcareous shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 3 inches; clay loam
Bt—3 to 22 inches; clay
Bk—22 to 33 inches; clay loam
Cr—33 to 60 inches; bedrock
Note: Permeability of the Leiter soil is slow. Available water capacity is moderate. Effective rooting depth is 20 to 40 inches. Runoff is high. The hazard of water erosion is severe. The hazard of wind erosion is moderate.

Typical soil descriptions with range in characteristics are included, in alphabetical order, in the section Soil Series and Their Morphology.

Additional Components

Cromack: 6 percent
Echeta: 7 percent
Jaywest: 7 percent

Use and Management

This unit is used primarily as rangeland and wildlife habitat. A few areas are also used for homesite and urban development.

The Moorhead soil is moderately well suited for stockwater ponds. The main limitation is slope. The Leiter soil is poorly suited for stockwater ponds. The main limitation is depth to bedrock.

This unit is well suited for mechanical range renovation and moderately well suited for range seeding. The main limitation for range seeding is the hazard of water erosion. To reduce the hazard of erosion, adequate residue must be maintained on the surface at all times until the seeding is established. Renovation and tillage for seeding should be along the contour of the slope. The low annual precipitation should be considered when planning a seeding.

This unit is moderately well suited to homesite and urban development. The main limitations are the moderate shrink-swell potential, low strength of the soils, and slope. The depth to bedrock within the Leiter soil is also a limitation. The effects of shrinking and swelling can be minimized by using proper engineering designs and by backfilling with material that has low shrink-swell potential. Buildings and roads should be designed to offset the limited ability of these soils to support a load. The deep cuts needed to provide essentially level building sites on the Leiter soil can create exposed areas of bedrock.

For general and detailed information about managing this map unit, see the following sections in Part II of this publication: Agronomy, Range, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

185—Moskee fine sandy loam, 0 to 6 percent slopes

Setting

Elevation: 4,100 to 5,000 feet
Mean annual precipitation: 14 to 17 inches
Frost-free period: 105 to 130 days

Major Component Description

Moskee and similar soils

Composition: 85 percent
Landform: Alluvial fan, fan remnant
Landform Element: None assigned
Slope: 0 to 6 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Parent Material: Alluvium and/or eolian deposits derived from calcareous sandstone
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 9 inches; fine sandy loam
Bt—9 to 32 inches; sandy clay loam
Bk—32 to 60 inches; fine sandy loam
Note: Permeability of the Moskee soil is moderate. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is low. The hazard of water erosion is slight. The hazard of wind erosion is severe.

Typical soil descriptions with range in characteristics are included, in alphabetical order, in the section Soil Series and Their Morphology.

Additional Components

Arwite: 3 percent
Deekay: 3 percent
Forkwood: 3 percent
Hiland: 3 percent
Recluse: 3 percent

Use and Management

This unit is used as rangeland, nonirrigated hayland and pasture, nonirrigated cropland, and wildlife habitat.

This unit is poorly suited for stockwater ponds. The main limitation is the high potential for seepage losses.

This unit is moderately well suited for mechanical range renovation and range seeding. The main limitation for range seeding is the hazard of wind erosion. To reduce the hazard of wind erosion, adequate residue must be maintained on the surface at all times until the seeding is established. Tilled areas must remain narrow and at right angles to the wind. Mechanical range renovation may not be economically feasible due to the coarse texture of the surface layer. The low annual precipitation should be considered when planning a seeding.

This unit is moderately well suited for nonirrigated hayland and pasture. The main limitation is low annual precipitation. Rotation grazing maintains optimum vigor and quality of forage.

This unit is moderately suited for nonirrigated cropland. The main limitations are low annual precipitation, droughtiness of the soil, and the hazard

of wind erosion. Because of the low annual precipitation, a crop rotation that most effectively uses soil moisture should be used. Reducing or eliminating tillage operations increases the effective use of soil moisture. Wind erosion can be reduced by planting crops in alternate strips and at right angles to the prevailing wind.

For general and detailed information about managing this map unit, see the following sections in Part II of this publication: Agronomy, Range, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

186—Moskee fine sandy loam, 6 to 10 percent slopes

Setting

Elevation: 4,100 to 5,000 feet
Mean annual precipitation: 14 to 17 inches
Frost-free period: 105 to 130 days

Major Component Description

Moskee and similar soils

Composition: 80 percent
Landform: Hill, ridge
Landform Element: Backslope, footslope
Slope: 6 to 10 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Parent Material: Alluvium and/or eolian deposits derived from calcareous sandstone
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 4 inches; fine sandy loam
Bt—4 to 16 inches; sandy clay loam
Bk—16 to 60 inches; fine sandy loam
Note: Permeability of the Moskee soil is moderate. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is low. The hazard of water erosion is moderate. The hazard of wind erosion is severe.

Additional Components

Arwite: 8 percent
Elwop: 8 percent
Areas with 10-15 percent slope: 4 percent

Use and Management

This unit is used primarily as rangeland and wildlife habitat.

This unit is poorly suited for stockwater ponds. The main limitation is the high potential for seepage losses.

This unit is moderately well suited for mechanical range renovation and range seeding. The main limitation for range seeding is the hazard of wind erosion. To reduce the hazard of wind erosion, adequate residue must be maintained on the surface at all times until the seeding is established. Tilled areas must remain narrow and at right angles to the wind. Mechanical range renovation may not be economically feasible due to the coarse texture of the surface layer. The low annual precipitation should be considered when planning a seeding.

For general and detailed information about managing this map unit, see the following sections in Part II of this publication: Agronomy, Range, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

187—Nuncho loam, 0 to 6 percent slopes

Setting

Elevation: 4,300 to 5,200 feet
Mean annual precipitation: 14 to 17 inches
Frost-free period: 105 to 130 days

Major Component Description

Nuncho and similar soils

Composition: 80 percent
Landform: Alluvial fan, fan remnant
Landform Element: None assigned
Slope: 0 to 6 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Parent Material: Alluvium derived from sandstone and shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 12 inches; loam
Bt—12 to 30 inches; clay
Bk—30 to 60 inches; clay loam
Note: Permeability of the Nuncho soil is slow.

Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is medium. The hazard of water erosion is slight. The hazard of wind erosion is moderate.

Typical soil descriptions with range in characteristics are included, in alphabetical order, in the section Soil Series and Their Morphology.

Additional Components

Platmak: 4 percent
Recluse: 4 percent
Deekay: 3 percent
Forkwood: 3 percent
Moorhead: 3 percent
Ulm: 3 percent

Use and Management

This unit is used as rangeland, nonirrigated hayland and pasture, nonirrigated cropland, and wildlife habitat.

This unit is well suited for stockwater ponds, mechanical range renovation, and range seeding. Adequate residue must be maintained on the surface at all times until the seeding is established. The low annual precipitation should be considered when planning a seeding.

This unit is moderately well suited for nonirrigated hayland and pasture. The main limitation is low annual precipitation. Proper stocking rates, pasture rotation, and restricted grazing during wet periods help to keep the pasture in good condition.

This unit is moderately well suited to nonirrigated cropland. The main limitations are low annual precipitation and the hazard of wind erosion. Because of the low annual precipitation, a crop rotation that most effectively uses soil moisture should be used. Reducing or eliminating tillage operations increases the effective use of soil moisture. Crop residue left on or near the surface helps to conserve moisture, maintain tilth, and control erosion. Keeping the soil rough and cloddy when it is not protected by vegetation helps to control wind erosion. A tillage pan forms easily if this soil is tilled when wet. Chiseling or subsoiling can be used to break up the tillage pan.

For general and detailed information about managing this map unit, see the following sections in Part II of this publication: Agronomy, Range, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

188—Orpha-Tullock loamy sands, 6 to 30 percent slopes

Setting

Elevation: 4,100 to 5,200 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 105 to 130 days

Major Component Description

Orpha and similar soils

Composition: 40 percent
Landform: Dune
Landform Element: Backslope, footslope
Slope: 6 to 30 percent
Depth to Restrictive Feature: None noted
Drainage Class: Excessively drained
Parent Material: Eolian deposits derived from sandstone
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 4 inches; loamy sand
C—4 to 60 inches; loamy sand
Note: Permeability of the Orpha soil is rapid. Available water capacity is very low. Effective rooting depth is 60 inches or more. Runoff is very low. The hazard of water and wind erosion is severe.

Tullock and similar soils

Composition: 40 percent
Landform: Dune
Landform Element: Shoulder, summit
Slope: 6 to 30 percent
Depth to Restrictive Feature: Bedrock (paralithic): 20 to 40 inches
Drainage Class: Excessively drained
Parent Material: Alluvium and/or eolian deposits over residuum weathered from calcareous sandstone
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 8 inches; loamy sand
C—8 to 30 inches; loamy sand
Cr—30 to 60 inches; bedrock

Note: Permeability of the Tullock soil is rapid. Available water capacity is very low. Effective rooting depth is 20 to 40 inches. Runoff is very low. The hazard of water erosion is slight. The hazard of wind erosion is severe.

Typical soil descriptions with range in characteristics are included, in alphabetical order, in the section Soil Series and Their Morphology.

Additional Components

Embry: 5 percent
Niobrara: 5 percent
Terro: 5 percent
Badland: 4 percent
Blowouts: 1 percent

Use and Management

This unit is used as rangeland and wildlife habitat.

This unit is poorly suited for stockwater ponds. The main limitations are the depth to bedrock within the Tullock soil and the high potential of both soils for seepage losses.

This unit is poorly suited for mechanical range renovation and range seeding. The main limitation is the hazard of erosion. Mechanical range renovation is not economically feasible due to the coarse texture of the surface layer. To reduce the hazard of erosion, adequate residue must be maintained on the surface at all times until the seeding is established. The low annual precipitation should be considered when planning a seeding.

For general and detailed information about managing this map unit, see the following sections in Part II of this publication: Agronomy, Range, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

189—Oshoto-Moorhead loams, 0 to 6 percent slopes

Setting

Elevation: 4,300 to 4,800 feet
Mean annual precipitation: 14 to 17 inches
Frost-free period: 105 to 130 days

Major Component Description

Oshoto and similar soils

Composition: 50 percent
Landform: Alluvial fan, fan remnant
Landform Element: None assigned
Slope: 0 to 6 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Parent Material: Alluvium and/or eolian deposits derived from sandstone and shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 7 inches; silt loam
Bt—7 to 32 inches; silty clay loam
Bk—32 to 60 inches; silt loam
Note: Permeability of the Oshoto soil is moderate. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is medium. The hazard of water and wind erosion is moderate.

Moorhead and similar soils

Composition: 30 percent
Landform: Alluvial fan, fan remnant
Landform Element: None assigned
Slope: 0 to 6 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Parent Material: Alluvium derived from calcareous shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 5 inches; loam
Bt—5 to 35 inches; clay
Bk—35 to 60 inches; clay loam
Note: Permeability of the Moorhead soil is slow. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is medium. The hazard of water erosion is slight. The hazard of wind erosion is moderate.

Typical soil descriptions with range in characteristics are included, in alphabetical order, in the section Soil Series and Their Morphology.

Additional Components

Deekay: 5 percent
Jaywest: 5 percent
Nuncho: 5 percent
Recluse: 5 percent

Use and Management

This unit is used as rangeland, nonirrigated hayland and pasture, and wildlife habitat.

The Oshoto soil is moderately well suited for stockwater ponds. The main limitation is the moderate potential for seepage losses. The Moorhead soil is well suited for stockwater ponds.

This unit is well suited for mechanical range renovation and range seeding. To reduce the hazard of wind erosion, adequate residue must be maintained on the surface at all times until the seeding is established. Tilled areas must remain narrow and at right angles to the wind. The low annual precipitation should be considered when planning a seeding.

This unit is moderately well suited for nonirrigated hayland and pasture. The main limitation is low annual precipitation. Proper stocking rates, pasture rotation, and restricted grazing during wet periods help to keep the pasture in good condition.

For general and detailed information about managing this map unit, see the following sections in Part II of this publication: Agronomy, Range, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

190—Parmleed-Renohill complex, 3 to 15 percent slopes

Setting

Elevation: 4,100 to 5,200 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 105 to 130 days

Major Component Description

Parmleed and similar soils

Composition: 50 percent
Landform: Hill, ridge
Landform Element: Summit, shoulder
Slope: 3 to 15 percent
Depth to Restrictive Feature: Bedrock (paralithic): 20 to 40 inches
Drainage Class: Well drained
Parent Material: Alluvium over residuum weathered from calcareous shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
E—0 to 3 inches; loam
Bt—3 to 21 inches; clay
Bk—21 to 27 inches; clay loam
Cr—27 to 60 inches; bedrock
Note: Permeability of the Parmleed soil is slow. Available water capacity is low. Effective rooting depth is 20 to 40 inches. Runoff is high. The hazard of water erosion is severe. The hazard of wind erosion is moderate.

Renohill and similar soils

Composition: 30 percent
Landform: Hill, ridge
Landform Element: Summit, shoulder
Slope: 3 to 15 percent
Depth to Restrictive Feature: Bedrock (paralithic): 20 to 40 inches
Drainage Class: Well drained
Parent Material: Alluvium over residuum weathered from calcareous shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 4 inches; clay loam
Bt—4 to 24 inches; clay
Bk—24 to 35 inches; clay loam
Cr—35 to 60 inches; bedrock
Note: Permeability of the Renohill soil is slow. Available water capacity is moderate. Effective rooting depth is 20 to 40 inches. Runoff is high. The hazard of water erosion is severe. The hazard of wind erosion is moderate.

Typical soil descriptions with range in characteristics are included, in alphabetical order, in the section Soil Series and Their Morphology.

Additional Components

Bidman: 4 percent
Savageton: 4 percent
Ulm: 4 percent
Worf: 4 percent
Worfka: 4 percent

Use and Management

This unit is used as rangeland and wildlife habitat.

This unit is poorly suited for stockwater ponds. The main limitation is depth to bedrock.

This unit is moderately well suited for mechanical range renovation and well suited for range seeding.

The main limitation for range seeding is the hazard of water erosion. To reduce the hazard of erosion, adequate residue must be maintained on the surface at all times until the seeding is established. Renovation and tillage for seeding should be along the contour of the slope. The low annual precipitation should be considered when planning a seeding.

For general and detailed information about managing this map unit, see the following sections in Part II of this publication: Agronomy, Range, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

191—Pits-Dumps complex

Setting

Elevation: 4,100 to 5,200 feet
Mean annual precipitation: 10 to 17 inches
Frost-free period: 105 to 130 days

Major Component Description

Pits

Composition: 60 percent
Landform: None assigned
Landform Element: None assigned
Slope: None assigned
Depth to Restrictive Feature: None noted
Drainage Class: None assigned
Parent Material: None assigned
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: No seasonal ponding exists
Note: Open pits are vertical or very steep excavations into sedimentary rock consisting of rippable shale with interbedded sandstone and minor coal seams. The material is commonly medium textured, but some layers are coarse textured or fine textured.

Dumps

Composition: 40 percent
Landform: None assigned
Landform Element: None assigned
Slope: None assigned
Depth to Restrictive Feature: None noted
Drainage Class: None assigned
Parent Material: None assigned
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: No seasonal ponding exists
Note: Dump areas vary from relatively gently sloping overburden piles to very steep conical shaped piles which are characteristic of overburden placement with draglines. Included in dump areas are topsoil stockpiles which will be replaced on the recontoured surface during final reclamation.

Additional Components

None

Use and Management

This map unit consists of open pits and spoil material from small to large scale coal mining operations. Most areas are currently being mined and reclamation is not feasible at this time. This unit is about 60 percent pits and 40 percent dumps.

Onsite investigation of individual areas is necessary to determine reclamation potential. Backfilling excavations and reshaping cut slopes reduce the risk of erosion. Backfilling with suitable topsoil aids revegetation.

For general and detailed information about managing this map unit, see the following sections in Part II of this publication: Agronomy, Range, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

192—Platmak loam, 0 to 6 percent slopes

Setting

Elevation: 4,100 to 5,000 feet
Mean annual precipitation: 14 to 17 inches
Frost-free period: 105 to 130 days

Major Component Description

Platmak and similar soils

Composition: 80 percent
Landform: Alluvial fan, fan remnant
Landform Element: None assigned
Slope: 0 to 6 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Parent Material: Alluvium derived from calcareous shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None

Typical profile:
E—0 to 4 inches; loam
Bt—4 to 27 inches; clay
Bk—27 to 60 inches; clay loam
Note: Permeability of the Platmak soil is slow. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is medium. The hazard of water erosion is slight. The hazard of wind erosion is moderate.

Typical soil descriptions with range in characteristics are included, in alphabetical order, in the section Soil Series and Their Morphology.

Additional Components

Nuncho: 6 percent
Bidman: 4 percent
Jaywest: 4 percent
Deekay: 2 percent
Felix, ponded: 2 percent
Forkwood: 2 percent

Use and Management

This unit is used as rangeland, nonirrigated hayland and pasture, nonirrigated cropland, and wildlife habitat.

This unit is well suited for stockwater ponds, mechanical range renovation, and range seeding. Adequate residue must be maintained on the surface at all times until the seeding is established. The low annual precipitation should be considered when planning a seeding.

This unit is moderately well suited for nonirrigated hayland and pasture. The main limitation is low annual precipitation. Proper stocking rates, pasture rotation, and restricted grazing during wet periods help to keep the pasture in good condition.

This unit is moderately well suited for nonirrigated cropland. The main limitations are low annual precipitation and moderate hazard of water and wind erosion. Because of the low annual precipitation, a crop rotation that most effectively uses soil moisture should be used. Reducing or eliminating tillage operations increases the effective use of soil moisture. Wind erosion can be reduced by planting crops in alternate strips and at right angles to the prevailing wind. Crop residue left on or near the surface helps to conserve moisture, maintain tilth, and control water and wind erosion. A tillage pan forms easily if this soil is tilled when wet. Chiseling or subsoiling can be used to break up the tillage pan.

For general and detailed information about managing this map unit, see the following sections in Part II of this publication: Agronomy, Range, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

193—Pugsley-Decolney sandy loams, 0 to 6 percent slopes

Setting

Elevation: 4,100 to 5,000 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 105 to 130 days

Major Component Description

Pugsley and similar soils

Composition: 50 percent
Landform: Hill, ridge
Landform Element: Summit, shoulder
Slope: 0 to 6 percent
Depth to Restrictive Feature: Bedrock (paralithic): 20 to 40 inches
Drainage Class: Well drained
Parent Material: Eolian deposits over residuum weathered from calcareous sandstone
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 3 inches; sandy loam
Bt—3 to 13 inches; sandy clay loam
C—13 to 25 inches; sandy loam
Cr—25 to 60 inches; bedrock
Note: Permeability of the Pugsley soil is moderate. Available water capacity is very low. Effective rooting depth is 20 to 40 inches. Runoff is low. The hazard of water erosion is slight. The hazard is wind erosion is severe.

Decolney and similar soils

Composition: 30 percent
Landform: Hill, ridge
Landform Element: Backslope, footslope
Slope: 0 to 6 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Parent Material: Alluvium over eolian deposits derived from sandstone and shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet

Ponding: None
Typical profile:
A—0 to 3 inches; sandy loam
Bt—3 to 22 inches; sandy clay loam
C1—22 to 43 inches; sandy loam
C2—43 to 60 inches; sandy loam
Note: Permeability of the Decolney soil is moderate. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is low. The hazard of water erosion is slight. The hazard of wind erosion is severe.

Typical soil descriptions with range in characteristics are included, in alphabetical order, in the section Soil Series and Their Morphology.

Additional Components

Bowbac: 10 percent
Hiland: 10 percent

Use and Management

This unit is used primarily as rangeland and wildlife habitat.

This unit is poorly suited for stockwater ponds. The main limitations are the depth to bedrock within the Pugsley soil and the high potential of both soils for seepage losses.

This unit is moderately well suited for mechanical range renovation and range seeding. The main limitation for range seeding is the hazard of wind erosion. Mechanical range renovation may not be economically feasible due to the coarse texture of the surface layer. To reduce the hazard of wind erosion, adequate residue must be maintained on the surface at all times until the seeding is established. Tilled areas must remain narrow and at right angles to the wind. The low annual precipitation should be considered when planning a seeding.

For general and detailed information about managing this map unit, see the following sections in Part II of this publication: Agronomy, Range, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

194—Pugsley-Decolney sandy loams, 6 to 15 percent slopes

Setting

Elevation: 4,100 to 5,000 feet
Mean annual precipitation: 10 to 17 inches
Frost-free period: 105 to 130 days

Major Component Description

Pugsley and similar soils

Composition: 50 percent
Landform: Hill, ridge
Landform Element: Summit, shoulder
Slope: 6 to 15 percent
Depth to Restrictive Feature: Bedrock (paralithic): 20 to 40 inches
Drainage Class: Well drained
Parent Material: Alluvium over residuum weathered from calcareous sandstone
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 3 inches; sandy loam
Bt—3 to 13 inches; sandy clay loam
C—13 to 25 inches; sandy loam
Cr—25 to 60 inches; bedrock
Note: Permeability of the Pugsley soil is moderate. Available water capacity is very low. Effective rooting depth is 20 to 40 inches. Runoff is medium. The hazard of water and wind erosion is severe.

Decolney and similar soils

Composition: 30 percent
Landform: Hill, ridge
Landform Element: Backslope, footslope
Slope: 6 to 15 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Parent Material: Alluvium over eolian deposits derived from sandstone and shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 3 inches; sandy loam
Bt—3 to 22 inches; sandy clay loam
C1—22 to 43 inches; sandy loam
C2—43 to 60 inches; sandy loam
Note: Permeability of the Decolney soil is moderate. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is medium. The hazard of water and wind erosion is severe.

Typical soil descriptions with range in characteristics are included, in alphabetical order, in the section Soil Series and Their Morphology.

Additional Components

Bowbac: 7 percent
Hiland: 7 percent
Worf: 6 percent

Use and Management

This unit is used as rangeland and wildlife habitat.

This unit is poorly suited for stockwater ponds. The main limitations are the depth to bedrock within the Pugsley soil and the high potential of both soils for seepage losses.

This unit is poorly suited for mechanical range renovation and range seeding. The main limitation for range seeding is the hazard of erosion. Mechanical range renovation may not be economically feasible due to the coarse texture of the surface layer. To reduce the hazard of erosion, adequate residue must be maintained on the surface at all times until the seeding is established. Tilled areas must remain narrow and at right angles to the wind. The low annual precipitation should be considered when planning a seeding.

For general and detailed information about managing this map unit, see the following sections in Part II of this publication: Agronomy, Range, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

195—Rauzi fine sandy loam, 0 to 6 percent slopes

Setting

Elevation: 4,300 to 4,800 feet
Mean annual precipitation: 14 to 17 inches
Frost-free period: 105 to 130 days

Major Component Description

Rauzi and similar soils

Composition: 85 percent
Landform: Fan remnants
Landform Element: None assigned
Slope: 0 to 6 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Parent Material: Alluvium and/or eolian deposits derived from calcareous sandstone
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 3 inches; fine sandy loam
Bt—3 to 30 inches; sandy clay loam
C—30 to 60 inches; sandy loam
Note: Permeability of the Rauzi soil is moderate. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is low. The hazard of water erosion is slight. The hazard of wind erosion is severe.

Typical soil descriptions with range in characteristics are included, in alphabetical order, in the section Soil Series and Their Morphology.

Additional Components

Arwite: 7 percent
Deekay: 2 percent
Elwop: 2 percent
Vonalf: 2 percent
Xema: 2 percent

Use and Management

This unit is used as rangeland, nonirrigated hayland and pasture, and wildlife habitat. A few areas are also used for homesite and urban development.

This unit is poorly suited for stockwater ponds. The main limitation is the high potential for seepage losses.

This unit is moderately well suited for mechanical range renovation and range seeding. The main limitation for range seeding is the hazard of wind erosion. To reduce the hazard of wind erosion, adequate residue must be maintained on the surface at all times until the seeding is established. Tilled areas must remain narrow and at right angles to the wind. The low annual precipitation should be considered when planning a seeding. Mechanical range renovation may not be economically feasible due to the coarse texture of the surface layer.

This unit is moderately well suited for nonirrigated hayland and pasture. The main limitation is low annual precipitation. Rotation grazing maintains optimum vigor and quality of forage.

This unit is well suited for homesite and urban development. The hazard of wind erosion increases if the soil is left exposed during site development. Revegetating disturbed areas around construction sites as soon as possible helps to control wind erosion.

For general and detailed information about managing this map unit, see the following sections in Part II of this publication: Agronomy, Range, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

196—Rauzi sandy clay loam, 0 to 6 percent slopes

Setting

Elevation: 4,300 to 4,800 feet
Mean annual precipitation: 14 to 17 inches
Frost-free period: 105 to 130 days

Major Component Description

Rauzi and similar soils

Composition: 75 percent
Landform: Alluvial fan, fan remnant
Landform Element: None assigned
Slope: 0 to 6 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Parent Material: Alluvium and/or eolian deposits derived from calcareous sandstone
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 6 inches; sandy clay loam
Bt—6 to 30 inches; sandy clay loam
C—30 to 60 inches; sandy loam
Note: Permeability of the Rauzi soil is moderate. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is low. The hazard of water erosion is slight. The hazard of wind erosion is moderate.

Typical soil descriptions with range in characteristics are included, in alphabetical order, in the section Soil Series and Their Morphology.

Additional Components

Arwite: 7 percent
Elwop: 6 percent
Moorhead: 6 percent
Moskee: 6 percent

Use and Management

This unit is used as rangeland, nonirrigated hayland and pasture, and wildlife habitat.

This unit is poorly suited for stockwater ponds. The main limitation is the high potential for seepage losses.

This unit is well suited for mechanical range renovation and range seeding. To reduce the hazard of wind erosion, adequate residue must be maintained on the surface at all times until the seeding is established. Tilled areas must remain narrow and at right angles to the wind. The low annual precipitation should be considered when planning a seeding.

This unit is moderately well suited for nonirrigated hayland and pasture. The main limitation is low annual precipitation. Proper stocking rates, pasture rotation, and restricted grazing during wet periods help to keep the pasture in good condition.

For general and detailed information about managing this map unit, see the following sections in Part II of this publication: Agronomy, Range, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

197—Rauzi-Elwop fine sandy loams, 2 to 10 percent slopes

Setting

Elevation: 4,300 to 4,800 feet
Mean annual precipitation: 14 to 17 inches
Frost-free period: 105 to 130 days

Major Component Description

Rauzi and similar soils

Composition: 60 percent
Landform: Hills
Landform Element: Backslope, footslope
Slope: 2 to 10 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Parent Material: Alluvium and/or eolian deposits derived from calcareous sandstone
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 3 inches; fine sandy loam
Bt—3 to 30 inches; sandy clay loam
C—30 to 60 inches; sandy loam
Note: Permeability of the Rauzi soil is moderate.

Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is low. The hazard of water erosion is moderate. The hazard of wind erosion is severe.

Elwop and similar soils

Composition: 20 percent
Landform: Hill, ridge
Landform Element: Summit, shoulder
Slope: 2 to 10 percent
Depth to Restrictive Feature: Bedrock (paralithic): 20 to 40 inches
Drainage Class: Well drained
Parent Material: Alluvium and/or eolian deposits over residuum weathered from calcareous sandstone
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 4 inches; fine sandy loam
Bt—4 to 24 inches; sandy clay loam
Bk—24 to 35 inches; fine sandy loam
Cr—35 to 60 inches; bedrock
Note: Permeability of the Elwop soil is moderate. Available water capacity is moderate. Effective rooting depth is 20 to 40 inches. Runoff is low. The hazard of water erosion is moderate. The hazard of wind erosion is severe.

Typical soil descriptions with range in characteristics are included, in alphabetical order, in the section Soil Series and Their Morphology.

Additional Components

Arwite: 5 percent
Julesburg: 5 percent
Vonalf: 4 percent
Xema: 4 percent
Areas with 0 to 2 percent slope: 2 percent

Use and Management

This unit is used primarily as rangeland and wildlife habitat.

This unit is poorly suited for stockwater ponds. The main limitations are the depth to bedrock within the Elwop soil and the high potential of both soils for seepage losses.

This unit is moderately well suited for mechanical range renovation and range seeding. The main limitation for range seeding is the hazard of wind erosion. To reduce the hazard of wind erosion, adequate residue must be maintained on the surface at all times until the seeding is established. Tilled areas must remain narrow and at right angles to the wind. The low annual precipitation should be considered when planning a seeding. Mechanical range renovation may not be economically feasible due to the coarse texture of the surface layer.

For general and detailed information about managing this map unit, see the following sections in Part II of this publication: Agronomy, Range, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

198—Recluse loam, 0 to 6 percent slopes

Setting

Elevation: 4,100 to 5,000 feet
Mean annual precipitation: 14 to 17 inches
Frost-free period: 105 to 130 days

Major Component Description

Recluse and similar soils

Composition: 80 percent
Landform: Alluvial fan, fan remnant
Landform Element: None assigned
Slope: 0 to 6 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Parent Material: Alluvium derived from sandstone and shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 5 inches; loam
Bt—5 to 23 inches; clay loam
Bk—23 to 60 inches; loam
Note: Permeability of the Recluse soil is moderate. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is low. The hazard of water erosion is slight. The hazard of wind erosion is moderate.

Typical soil descriptions with range in characteristics are included, in alphabetical order, in the section Soil Series and Their Morphology.

Additional Components

Deekay: 4 percent
Moskee: 4 percent

Nuncho: 4 percent
Oldwolf: 4 percent
Platmak: 4 percent

Use and Management

This unit is used as rangeland, nonirrigated hayland and pasture, nonirrigated cropland, and wildlife habitat.

This unit is moderately well suited for stockwater ponds. The main limitation is the moderate potential for seepage losses.

This unit is well suited for mechanical range renovation and range seeding. Adequate residue must be maintained on the surface at all times until the seeding is established. Tilled areas must remain narrow and at right angles to the wind. The low annual precipitation should be considered when planning a seeding.

This unit is moderately well suited for nonirrigated hayland and pasture. The main limitation is low annual precipitation. Proper stocking rates, pasture rotation, and restricted grazing during wet periods help to keep the pasture in good condition.

This unit is moderately well suited for nonirrigated cropland. The main limitations are low annual precipitation and the hazard of wind erosion. Because of the low annual precipitation, a crop rotation that most effectively uses soil moisture should be used. Reducing or eliminating tillage operations increases the effective use of soil moisture. Crop residue left on or near the surface helps to conserve moisture, maintain tilth, and control water and wind erosion. Wind erosion can be reduced by planting crops in alternate strips and at right angles to the prevailing wind.

For general and detailed information about managing this map unit, see the following sections in Part II of this publication: Agronomy, Range, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

199—Renohill-Savageton clay loams, 0 to 6 percent slopes

Setting

Elevation: 4,100 to 5,000 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 105 to 130 days

Major Component Description

Renohill and similar soils

Composition: 50 percent
Landform: Hill, ridge
Landform Element: Backslope, summit
Slope: 0 to 6 percent
Depth to Restrictive Feature: Bedrock (paralithic): 20 to 40 inches
Drainage Class: Well drained
Parent Material: Alluvium over residuum weathered from calcareous shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 3 inches; clay loam
Bt—3 to 24 inches; clay
Bk—24 to 36 inches; clay loam
Cr—36 to 60 inches; bedrock
Note: Permeability of the Renohill soil is slow. Available water capacity is moderate. Effective rooting depth is 20 to 40 inches. Runoff is medium. The hazard of water erosion is slight. The hazard of wind erosion is moderate.

Savageton and similar soils

Composition: 30 percent
Landform: Hill, ridge
Landform Element: Summit, shoulder
Slope: 0 to 6 percent
Depth to Restrictive Feature: Bedrock (paralithic): 20 to 40 inches
Drainage Class: Well drained
Parent Material: Alluvium over residuum weathered from calcareous shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 4 inches; clay loam
Bw—4 to 22 inches; clay
Bk—22 to 36 inches; clay loam
Cr—36 to 60 inches; bedrock
Note: Permeability of the Savageton soil is slow. Available water capacity is moderate. Effective rooting depth is 20 to 40 inches. Runoff is medium. The hazard of water erosion is slight. The hazard of wind erosion is moderate.

Typical soil descriptions with range in characteristics are included, in alphabetical order, in the section Soil Series and Their Morphology.

Additional Components

Bidman: 4 percent
Heldt: 4 percent
Samday: 4 percent
Ulm: 4 percent
Worfka: 4 percent

Use and Management

This unit is used primarily as rangeland and wildlife habitat.

This unit is poorly suited for stockwater ponds. The main limitation is depth to bedrock.

This unit is well suited for mechanical range renovation and range seeding. To reduce the hazard of wind erosion, adequate residue must be maintained on the surface at all times until the seeding is established. Tilled areas must remain narrow and at right angles to the wind. The low annual precipitation should be considered when planning a seeding.

For general and detailed information about managing this map unit, see the following sections in Part II of this publication: Agronomy, Range, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

200—Renohill-Savageton clay loams, 6 to 15 percent slopes

Setting

Elevation: 4,100 to 5,200 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 105 to 130 days

Major Component Description

Renohill and similar soils

Composition: 50 percent
Landform: Hill, ridge
Landform Element: Backslope, summit
Slope: 6 to 15 percent
Depth to Restrictive Feature: Bedrock (paralithic): 20 to 40 inches
Drainage Class: Well drained
Parent Material: Alluvium over residuum weathered from calcareous shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 3 inches; clay loam
Bt—3 to 24 inches; clay
Bk—24 to 36 inches; clay loam
Cr—36 to 60 inches; bedrock
Note: Permeability of the Renohill soil is slow. Available water capacity is moderate. Effective rooting depth is 20 to 40 inches. Runoff is high. The hazard of water erosion is severe. The hazard of wind erosion is moderate.

Savageton and similar soils

Composition: 30 percent
Landform: Hill, ridge
Landform Element: Summit, shoulder
Slope: 6 to 15 percent
Depth to Restrictive Feature: Bedrock (paralithic): 20 to 40 inches
Drainage Class: Well drained
Parent Material: Alluvium over residuum weathered from calcareous shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 4 inches; clay loam
Bw—4 to 22 inches; clay
Bk—22 to 36 inches; clay loam
Cr—36 to 60 inches; bedrock
Note: Permeability of the Savageton soil is slow. Available water capacity is moderate. Effective rooting depth is 20 to 40 inches. Runoff is high. The hazard of water erosion is severe. The hazard of wind erosion is moderate.

Typical soil descriptions with range in characteristics are included, in alphabetical order, in the section Soil Series and Their Morphology.

Additional Components

Samday: 5 percent
Ulm: 5 percent
Shingle: 3 percent
Theedle: 3 percent
Silhouette: 2 percent
Worfka: 2 percent

Use and Management

This unit is used as rangeland and wildlife habitat.

This unit is poorly suited for stockwater ponds. The main limitation is depth to bedrock.

This unit is well suited for mechanical range renovation and moderately well suited for range seeding. The main limitation for range seeding is the hazard of water erosion. To reduce the hazard of erosion, adequate residue must be maintained on the surface at all times until the seeding is established. Renovation and tillage for seeding should be along the contour of the slope. The low annual precipitation should be considered when planning a seeding.

For general and detailed information about managing this map unit, see the following sections in Part II of this publication: Agronomy, Range, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

201—Renohill-Shingle-Worf complex, 3 to 15 percent slopes

Setting

Elevation: 4,100 to 5,000 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 105 to 130 days

Major Component Description

Renohill and similar soils

Composition: 45 percent
Landform: Hill, ridge
Landform Element: Backslope, summit
Slope: 3 to 10 percent
Depth to Restrictive Feature: Bedrock (paralithic): 20 to 40 inches
Drainage Class: Well drained
Parent Material: Alluvium over residuum weathered from calcareous shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 4 inches; clay loam
Bt—4 to 20 inches; clay
Bk—20 to 30 inches; clay loam
Cr—30 to 60 inches; bedrock
Note: Permeability of the Renohill soil is slow. Available water capacity is moderate. Effective rooting depth is 20 to 40 inches. Runoff is very high. The hazard of water and wind erosion is moderate.

Shingle and similar soils

Composition: 20 percent
Landform: Hill, ridge
Landform Element: Summit, shoulder
Slope: 3 to 15 percent
Depth to Restrictive Feature: Bedrock (paralithic): 10 to 20 inches
Drainage Class: Well drained
Parent Material: Residuum weathered from sandstone and shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 1 inches; loam
C—1 to 12 inches; loam
Cr—12 to 60 inches; bedrock
Note: Permeability of the Shingle soil is moderate. Available water capacity is very low. Effective rooting depth is 10 to 20 inches. Runoff is rapid. The hazard of water erosion is severe. The hazard of wind erosion is moderate.

Worf and similar soils

Composition: 15 percent
Landform: Hill, ridge
Landform Element: Summit, shoulder
Slope: 3 to 15 percent
Depth to Restrictive Feature: Bedrock (paralithic): 10 to 20 inches
Drainage Class: Well drained
Parent Material: Residuum weathered from sandstone and shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 1 inches; loam
Bt—1 to 10 inches; clay loam
Bk—10 to 14 inches; clay loam
Cr—14 to 60 inches; bedrock
Note: Permeability of the Worf soil is moderate. Available water capacity is very low. Effective rooting depth is 10 to 20 inches. Runoff is very high. The hazard of water erosion is severe. The hazard of wind erosion is moderate.

Typical soil descriptions with range in characteristics are included, in alphabetical order, in the section Soil Series and Their Morphology.

Additional Components

Cushman: 5 percent
Hilight: 5 percent
Ulm: 5 percent
Wags: 5 percent

Use and Management

This unit is used as rangeland and wildlife habitat.

This unit is poorly suited for stockwater ponds. The main limitation is depth to bedrock.

This unit is moderately well suited for range seeding. The main limitation is the hazard of water erosion. To reduce the hazard of wind erosion, adequate residue must be maintained on the surface at all times until the seeding is established. Tilled areas must remain narrow and at right angles to the wind. The Renohill soil is well suited and the Shingle and Worf soils are poorly suited for mechanical range renovation. Mechanical range renovation may not be economically feasible on the Shingle and Worf soils due to low potential to increase the amount of forage. If practical, renovation and tillage for seeding should be along the contour of the slope. The low annual precipitation should be considered when planning a seeding.

For general and detailed information about managing this map unit, see the following sections in Part II of this publication: Agronomy, Range, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

202—Renohill-Worfka clay loams, 3 to 15 percent slopes

Setting

Elevation: 4,100 to 5,000 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 105 to 130 days

Major Component Description

Renohill and similar soils

Composition: 50 percent
Landform: Hill, ridge
Landform Element: Backslope, summit
Slope: 3 to 15 percent
Depth to Restrictive Feature: Bedrock (paralithic): 20 to 40 inches
Drainage Class: Well drained
Parent Material: Alluvium over residuum weathered from calcareous shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 4 inches; clay loam
Bt—4 to 20 inches; clay
Bk—20 to 30 inches; clay loam
Cr—30 to 60 inches; bedrock
Note: Permeability of the Renohill soil is slow. Available water capacity is moderate. Effective rooting depth is 20 to 40 inches. Runoff is high. The hazard of water erosion is severe. The hazard of wind erosion is moderate.

Worfka and similar soils

Composition: 30 percent
Landform: Hill, ridge
Landform Element: Summit, shoulder
Slope: 3 to 15 percent
Depth to Restrictive Feature: Bedrock (paralithic): 10 to 20 inches
Drainage Class: Well drained
Parent Material: Residuum weathered from sandstone and shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 2 inches; clay loam
Bt—2 to 13 inches; clay
Bk—13 to 19 inches; clay loam
Cr—19 to 60 inches; bedrock
Note: Permeability of the Worfka soil is slow. Available water capacity is very low. Effective rooting depth is 10 to 20 inches. Runoff is very high. The hazard of water erosion is severe. The hazard of wind erosion is moderate.

Typical soil descriptions with range in characteristics are included, in alphabetical order, in the section Soil Series and Their Morphology.

Additional Components

Samday: 7 percent
Ulm: 7 percent
Shingle: 6 percent

Use and Management

This unit is used as rangeland and wildlife habitat.

This unit is poorly suited for stockwater ponds. The main limitation is depth to bedrock.

The Renohill soil is well suited and the Worfka soil is poorly suited for mechanical range renovation. Mechanical range renovation may not be economically feasible on the Worfka soil due to low potential to increase the amount of forage. This unit is moderately well suited for range seeding. The main limitation is the hazard of water erosion. To reduce the hazard of erosion, adequate residue must be maintained on the surface at all times until the seeding is established. The low annual precipitation should be considered when planning a seeding. Renovation and tillage for seeding should be along the contour of the slope.

For general and detailed information about managing this map unit, see the following sections in Part II of this publication: Agronomy, Range, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

203—Rockypoint-Iwait association, 0 to 6 percent slopes

Setting

Elevation: 4,300 to 4,800 feet
Mean annual precipitation: 15 to 17 inches
Frost-free period: 105 to 130 days

Major Component Description

Rockypoint and similar soils

Composition: 45 percent
Landform: Flood plain, stream terrace
Landform Element: None assigned
Slope: 0 to 3 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Parent Material: Alluvium derived from sandstone and shale
Flooding: Occasional
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 3 inches; loam
C—3 to 60 inches; stratified fine sandy loam to clay loam
Note: Permeability of the Rockypoint soil is moderate. Available water capacity is high. Runoff is low. The hazard of water erosion is slight. The hazard of wind erosion is moderate.

Iwait and similar soils

Composition: 35 percent
Landform: Stream terrace
Landform Element: None assigned
Slope: 0 to 6 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Parent Material: Alluvium derived from sandstone and shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 2 inches; loam
Bk—2 to 60 inches; clay loam
Note: Permeability of the Iwait soil is moderate. Available water capacity is high. Runoff is low. The hazard of water erosion is slight. The hazard of wind erosion is moderate.

Typical soil descriptions with range in characteristics are included, in alphabetical order, in the section Soil Series and Their Morphology.

Additional Components

Ashollow: 8 percent
Sodawells: 8 percent
Boruff: 2 percent
Poorly drained sandy soils: 2 percent

Use and Management

This unit is used as rangeland and wildlife habitat.

This unit is moderately well suited for stockwater ponds. The main limitation is the moderate potential for seepage losses.

This unit is well suited for mechanical range renovation and range seeding. Adequate residue must be maintained on the surface at all times until the seeding is established. Tilled areas must remain narrow and at right angles to the wind. The low annual precipitation should be considered when planning a seeding.

For general and detailed information about managing this map unit, see the following sections in Part II of this publication: Agronomy, Range,

Recreation, Wildlife Habitat, Engineering, and Soil Properties.

204—Samday-Samday, cool-Shingle clay loams, 6 to 40 percent slopes

Setting

Elevation: 4,100 to 4,800 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 105 to 130 days

Major Component Description

Samday and similar soils

Composition: 30 percent
Landform: Hill, ridge
Landform Element: Summit, shoulder
Slope: 6 to 40 percent
Depth to Restrictive Feature: Bedrock (paralithic): 10 to 20 inches
Drainage Class: Well drained
Parent Material: Residuum weathered from calcareous shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 2 inches; clay loam
C—2 to 16 inches; clay
Cr—16 to 60 inches; bedrock
Note: Permeability of the Samday soil is slow. Available water capacity is very low. Effective rooting depth is 10 to 20 inches. Runoff is very high. The hazard of water erosion is severe. The hazard of wind erosion is moderate.

Samday and similar soils

Composition: 25 percent
Landform: Hill, ridge
Landform Element: Summit, shoulder
Slope: 6 to 40 percent
Depth to Restrictive Feature: Bedrock (paralithic): 10 to 20 inches
Drainage Class: Well drained
Parent Material: Residuum weathered from calcareous shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 1 inches; clay loam
C—1 to 10 inches; clay
Cr—10 to 60 inches; bedrock
Note: Permeability of the Samday, cool soil is slow. Available water capacity is very low. Effective rooting depth is 7 to 20 inches. Runoff is rapid. The hazard of water erosion is severe. The hazard of wind erosion is moderate.

Shingle and similar soils

Composition: 20 percent
Landform: Hill, ridge
Landform Element: Summit, shoulder
Slope: 6 to 40 percent
Depth to Restrictive Feature: Bedrock (paralithic): 10 to 20 inches
Drainage Class: Well drained
Parent Material: Residuum weathered from sandstone and shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 3 inches; clay loam
C—3 to 16 inches; clay loam
Cr—16 to 60 inches; bedrock
Note: Permeability of the Shingle soil is moderate. Available water capacity is very low. Effective rooting depth is 10 to 20 inches. Runoff is very high. The hazard of water erosion is severe. The hazard of wind erosion is moderate.

Typical soil descriptions with range in characteristics are included, in alphabetical order, in the section Soil Series and Their Morphology.

Additional Components

Badland: 5 percent
Cushman: 5 percent
Savageton: 5 percent
Theedle: 5 percent
Wibaux, thin solum: 5 percent

Use and Management

This unit is used as rangeland and wildlife habitat.

This unit is poorly suited for stockwater ponds, mechanical range renovation, and range seeding.

The main limitations are depth to bedrock, steepness of slope, and the hazard of water erosion.

For general and detailed information about managing this map unit, see the following sections in Part II of this publication: Agronomy, Range, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

205—Samday-Savageton clay loams, 3 to 15 percent slopes

Setting

Elevation: 4,100 to 5,000 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 105 to 130 days

Major Component Description

Samday and similar soils

Composition: 40 percent
Landform: Hill, ridge
Landform Element: Summit, shoulder
Slope: 3 to 15 percent
Depth to Restrictive Feature: Bedrock (paralithic): 10 to 20 inches
Drainage Class: Well drained
Parent Material: Residuum weathered from calcareous shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 2 inches; clay loam
C—2 to 16 inches; clay
Cr—16 to 60 inches; bedrock
Note: Permeability of the Samday soil is slow. Available water capacity is very low. Effective rooting depth is 10 to 20 inches. Runoff is very high. The hazard of water erosion is severe. The hazard of wind erosion is moderate.

Savageton and similar soils

Composition: 40 percent
Landform: Hill, ridge
Landform Element: Summit, shoulder
Slope: 3 to 15 percent
Depth to Restrictive Feature: Bedrock (paralithic): 20 to 40 inches
Drainage Class: Well drained
Parent Material: Alluvium over residuum weathered from calcareous shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 5 inches; clay loam
Bw—5 to 15 inches; clay
Bk—15 to 28 inches; clay
Cr—28 to 60 inches; bedrock
Note: Permeability of the Savageton soil is slow. Available water capacity is low. Effective rooting depth is 20 to 40 inches. Runoff is high. The hazard of water erosion is moderate to severe. The hazard of wind erosion is moderate.

Typical soil descriptions with range in characteristics are included, in alphabetical order, in the section Soil Series and Their Morphology.

Additional Components

Heldt: 5 percent
Hilight: 5 percent
Theedle: 5 percent
Worfka: 5 percent

Use and Management

This unit is used as rangeland and wildlife habitat.

This unit is poorly suited for stockwater ponds. The main limitation is depth to bedrock.

The Samday soil is poorly suited for mechanical range renovation. Mechanical range renovation may not be economically feasible due to low potential to increase the amount of forage. The Savageton soil is well suited for mechanical range renovation. This unit is moderately well suited for range seeding. The main limitation is the hazard of water erosion. To reduce the hazard of erosion, adequate residue must be maintained on the surface at all times until the seeding is established. Renovation and tillage for seeding should be along the contour of the slope. The low annual precipitation should be considered when planning a seeding.

For general and detailed information about managing this map unit, see the following sections in Part II of this publication: Agronomy, Range, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

206—Samday-Shingle-Badland complex, 10 to 45 percent slopes

Setting

Elevation: 4,100 to 5,800 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 105 to 130 days

Major Component Description

Samday and similar soils

Composition: 35 percent
Landform: Hill, ridge
Landform Element: Summit, shoulder
Slope: 10 to 45 percent
Depth to Restrictive Feature: Bedrock (paralithic): 10 to 20 inches
Drainage Class: Well drained
Parent Material: Residuum weathered from calcareous shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 2 inches; clay loam
C—2 to 16 inches; clay
Cr—16 to 60 inches; bedrock
Note: Permeability of the Samday soil is slow. Available water capacity is very low. Effective rooting depth is 10 to 20 inches. Runoff is very high. The hazard of water erosion is severe. The hazard of wind erosion is moderate.

Shingle and similar soils

Composition: 30 percent
Landform: Hill, ridge
Landform Element: Summit, shoulder
Slope: 10 to 45 percent
Depth to Restrictive Feature: Bedrock (paralithic): 10 to 20 inches
Drainage Class: Well drained
Parent Material: Residuum weathered from sandstone and shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 2 inches; loam
C—2 to 12 inches; loam
Cr—12 to 60 inches; bedrock
Note: Permeability of the Shingle soil is moderate. Available water capacity is very low. Effective rooting depth is 10 to 20 inches. Runoff is very high. The hazard of water erosion is severe. The hazard of wind erosion is moderate.

Badland

Composition: 15 percent
Landform: Hill, ridge
Landform Element: Summit, shoulder
Slope: —-
Depth to Restrictive Feature: Bedrock (paralithic): 0 to 0 inches
Drainage Class: —-
Parent Material: Residuum weathered from sandstone and shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Note: Badland consists of exposures of shale and sandstone.

Typical soil descriptions with range in characteristics are included, in alphabetical order, in the section Soil Series and Their Morphology.

Additional Components

Areas with 45-60 percent slope: 4 percent
Hilight: 4 percent
Kishona: 4 percent
Theedle: 4 percent
Wags: 4 percent

Use and Management

This unit is used as rangeland and wildlife habitat. Occasional coniferous trees occur in some areas of the Rochelle Hills and on escarpments on the Pumpkin Buttes.

This unit is poorly suited for stockwater ponds, mechanical range renovation, and range seeding. The main limitations are depth to bedrock, steepness of slope, and the hazard of water erosion.

For general and detailed information about managing this map unit, see the following sections in Part II of this publication: Agronomy, Range, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

207—Cromack-Fairburn-Ucross complex, 3 to 20 percent slopes

Setting

Elevation: 4,300 to 4,800 feet
Mean annual precipitation: 15 to 17 inches
Frost-free period: 105 to 130 days

Major Component Description

Cromack and similar soils

Composition: 30 percent
Landform: Hill, ridge
Landform Element: Summit, shoulder
Slope: 3 to 15 percent
Depth to Restrictive Feature: Bedrock (paralithic): 20 to 40 inches
Drainage Class: Well drained
Parent Material: Alluvium over residuum weathered from calcareous shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 6 inches; clay loam
Bw—6 to 14 inches; clay
Bk—14 to 29 inches; clay
Cr—29 to 60 inches; bedrock
Note: Permeability of the Cromack soil is slow. Available water capacity is moderate. Effective rooting depth is 20 to 40 inches. Runoff is high. The hazard of water erosion is severe. The hazard of wind erosion is moderate.

Fairburn and similar soils

Composition: 30 percent
Landform: Hill, ridge
Landform Element: Summit, shoulder
Slope: 3 to 20 percent
Depth to Restrictive Feature: Bedrock (paralithic): 10 to 20 inches
Drainage Class: Well drained
Parent Material: Residuum weathered from sandstone and shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 4 inches; loam
C—4 to 15 inches; loam
Cr—15 to 60 inches; bedrock
Note: Permeability of the Fairburn soil is moderate. Available water capacity is very low. Effective rooting depth is 10 to 20 inches. Runoff is rapid. The hazard of water erosion is severe. The hazard of wind erosion is moderate.

Ucross and similar soils

Composition: 25 percent
Landform: Hill, ridge
Landform Element: Summit, shoulder
Slope: 3 to 20 percent
Depth to Restrictive Feature: Bedrock (paralithic): 20 to 40 inches
Drainage Class: Well drained
Parent Material: Alluvium over residuum weathered from sandstone and shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 5 inches; loam
Bk—5 to 31 inches; clay loam
Cr—31 to 60 inches; bedrock
Note: Permeability of the Ucross soil is moderate. Available water capacity is moderate. Effective rooting depth is 20 to 40 inches. Runoff is high. The hazard of water erosion is moderate to severe. The hazard of wind erosion is moderate.

Typical soil descriptions with range in characteristics are included, in alphabetical order, in the section Soil Series and Their Morphology.

Additional Components

Samsil: 5 percent
Badland: 4 percent
Iwait: 4 percent
Areas with 20-30 percent slope: 2 percent

Use and Management

This unit is used primarily as rangeland and wildlife habitat. Some areas are used for homesite and urban development.

This unit is poorly suited for stockwater ponds. The main limitation is depth to bedrock and steepness of slope.

The Cromack and Ucross soils are moderately well suited for mechanical range renovation. The main limitation is the hazard of water erosion. The Shingle soil is poorly suited for mechanical range renovation. Mechanical range renovation on the Shingle soil may not be economically feasible due to low potential to increase the amount of forage.

This unit is moderately suited for range seeding. The main limitation is the hazard of water erosion. To reduce the hazard of erosion, adequate residue must be maintained on the surface at all times until the seeding is established. Renovation and tillage for seeding should be along the contour of the slope. The use of tillage methods on areas with slopes greater than 15 percent is not recommended due to the hazard of water erosion. The low annual precipitation should be considered when planning a seeding.

This unit is poorly suited to homesite and urban development. The main limitations are depth to bedrock, shrink-swell potential, and low strength of the soils.

For general and detailed information about managing this map unit, see the following sections in Part II of this publication: Agronomy, Range, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

208—Savageton-Silhouette clay loams, 0 to 6 percent slopes

Setting

Elevation: 4,100 to 5,200 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 105 to 130 days

Major Component Description

Savageton and similar soils

Composition: 45 percent
Landform: Hill, ridge
Landform Element: Summit, shoulder
Slope: 0 to 6 percent
Depth to Restrictive Feature: Bedrock (paralithic): 20 to 40 inches
Drainage Class: Well drained
Parent Material: Alluvium over residuum weathered from calcareous shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 4 inches; clay loam
Bw—4 to 12 inches; clay
Bk—12 to 38 inches; clay
Cr—38 to 60 inches; bedrock
Note: Permeability of the Savageton soil is slow. Available water capacity is moderate. Effective rooting depth is 20 to 40 inches. Runoff is medium. The hazard of water erosion is slight. The hazard of wind erosion is moderate.

Silhouette and similar soils

Composition: 40 percent
Landform: Hill, ridge
Landform Element: Backslope, footslope
Slope: 0 to 6 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Parent Material: Alluvium derived from calcareous shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 2 inches; clay loam
Bw—2 to 28 inches; clay loam
Bk—28 to 60 inches; silty clay loam
Note: Permeability of the Silhouette soil is moderately slow. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is medium. The hazard of water and wind erosion is moderate.

Typical soil descriptions with range in characteristics are included, in alphabetical order, in the section Soil Series and Their Morphology.

Additional Components

Heldt: 5 percent
Renohill: 5 percent
Ulm: 5 percent

Use and Management

This unit is used primarily as rangeland and wildlife habitat.

The Savageton soil is poorly suited for stockwater ponds. The main limitation is the depth to bedrock. The Silhouette soil is well suited for stockwater ponds.

This unit is well suited for mechanical range renovation and range seeding. Adequate residue must be maintained on the surface at all times until the seeding is established. Tilled areas must remain narrow and at right angles to the wind. The low annual precipitation should be considered when planning a seeding.

For general and detailed information about managing this map unit, see the following sections in Part II of this publication: Agronomy, Range, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

209—Savageton-Silhouette clay loams, 6 to 15 percent slopes

Setting

Elevation: 4,100 to 5,200 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 105 to 130 days

Major Component Description

Savageton and similar soils

Composition: 40 percent
Landform: Hill, ridge
Landform Element: Summit, shoulder
Slope: 6 to 15 percent
Depth to Restrictive Feature: Bedrock (paralithic): 20 to 40 inches
Drainage Class: Well drained
Parent Material: Alluvium over residuum weathered from calcareous shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 3 inches; clay loam
Bw—3 to 19 inches; clay
Bk—19 to 36 inches; clay
Cr—36 to 60 inches; bedrock
Note: Permeability of the Savageton soil is slow. Available water capacity is moderate. Effective rooting depth is 20 to 40 inches. Runoff is high. The hazard of water erosion is severe. The hazard of wind erosion is moderate.

Silhouette and similar soils

Composition: 40 percent
Landform: Hill, ridge
Landform Element: Backslope, footslope
Slope: 6 to 15 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Parent Material: Alluvium derived from calcareous shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 3 inches; clay loam
Bw—3 to 15 inches; clay loam
Bk—15 to 60 inches; clay loam
Note: Permeability of the Silhouette soil is slow. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is medium to rapid. The hazard of water erosion is moderate to severe. The hazard of wind erosion is moderate.

Typical soil descriptions with range in characteristics are included, in alphabetical order, in the section Soil Series and Their Morphology.

Additional Components

Heldt: 5 percent
Renohill: 5 percent
Samday: 5 percent
Ulm: 5 percent

Use and Management

This unit is used as rangeland and wildlife habitat.

The Savageton soil is poorly suited for stockwater ponds. The main limitation is depth to bedrock. The Silhouette soil is moderately well suited for stockwater ponds. The main limitation is slope.

This unit is well suited for mechanical range renovation and moderately well suited for range seeding. The main limitation for range seeding is the hazard of water erosion. To reduce the hazard of erosion, adequate residue must be maintained on the surface at all times until the seeding is established. Renovation and tillage for seeding should be along the contour of the slope. The low annual precipitation should be considered when planning a seeding.

For general and detailed information about managing this map unit, see the following sections in Part II of this publication: Agronomy, Range, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

210—Shingle-Taluce complex, 3 to 30 percent slopes

Setting

Elevation: 4,100 to 5,200 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 105 to 130 days

Major Component Description

Shingle and similar soils

Composition: 40 percent
Landform: Hill, ridge
Landform Element: Summit, shoulder
Slope: 3 to 30 percent
Depth to Restrictive Feature: Bedrock (paralithic): 10 to 20 inches
Drainage Class: Well drained
Parent Material: Residuum weathered from sandstone and shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 2 inches; loam
C—2 to 12 inches; loam
Cr—12 to 60 inches; bedrock
Note: Permeability of the Shingle soil is moderate. Available water capacity is very low. Effective rooting depth is 10 to 20 inches. Runoff is very high. The hazard of water erosion is severe. The hazard of wind erosion is moderate.

Taluce and similar soils

Composition: 40 percent
Landform: Hill, ridge
Landform Element: Summit, shoulder
Slope: 3 to 30 percent
Depth to Restrictive Feature: Bedrock (paralithic): 10 to 20 inches
Drainage Class: Well drained
Parent Material: Residuum weathered from calcareous sandstone
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 2 inches; fine sandy loam
C—2 to 18 inches; fine sandy loam
Cr—18 to 60 inches; bedrock
Note: Permeability of the Taluce soil is rapid. Available water capacity is very low. Effective rooting depth is 10 to 20 inches. Runoff is very high. The hazard of water and wind erosion is severe.

Typical soil descriptions with range in characteristics are included, in alphabetical order, in the section Soil Series and Their Morphology.

Additional Components

Theedle: 5 percent
Turnercrest: 5 percent
Vonalee: 4 percent
Worf: 4 percent
Badland: 2 percent

Use and Management

This unit is used as rangeland and wildlife habitat. Occasional coniferous trees occur in some areas in the Rochelle Hills.

This unit is poorly suited for stockwater ponds, mechanical range renovation, and range seeding. The main limitations are depth to bedrock, steepness of slope, and the hazard of water and wind erosion.

For general and detailed information about managing this map unit, see the following sections in Part II of this publication: Agronomy, Range, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

211—Shingle-Worf loams, 3 to 30 percent slopes

Setting

Elevation: 4,100 to 5,000 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 105 to 130 days

Major Component Description

Shingle and similar soils

Composition: 45 percent
Landform: Hill, ridge
Landform Element: Summit, shoulder
Slope: 3 to 30 percent
Depth to Restrictive Feature: Bedrock (paralithic): 10 to 20 inches
Drainage Class: Well drained
Parent Material: Residuum weathered from sandstone and shale

Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 1 inches; loam
C—1 to 12 inches; loam
Cr—12 to 60 inches; bedrock
Note: Permeability of the Shingle soil is moderate. Available water capacity is very low. Effective rooting depth is 10 to 20 inches. Runoff is very high. The hazard of water erosion is severe. The hazard of wind erosion is moderate.

Worf and similar soils

Composition: 35 percent
Landform: Hill, ridge
Landform Element: Summit, shoulder
Slope: 3 to 30 percent
Depth to Restrictive Feature: Bedrock (paralithic): 10 to 20 inches
Drainage Class: Well drained
Parent Material: Residuum weathered from sandstone and shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 1 inches; loam
Bt—1 to 10 inches; clay loam
Bk—10 to 14 inches; clay loam
Cr—14 to 60 inches; bedrock
Note: Permeability of the Worf soil is moderate. Available water capacity is very low. Effective rooting depth is 10 to 20 inches. Runoff is very high. The hazard of water erosion is severe. The hazard of wind erosion is moderate.

Typical soil descriptions with range in characteristics are included, in alphabetical order, in the section Soil Series and Their Morphology.

Additional Components

Cushman: 5 percent
Samday: 5 percent
Taluce: 5 percent
Theedle: 5 percent

Use and Management

This unit is used as rangeland and wildlife habitat.

This unit is poorly suited for stockwater ponds, mechanical range renovation, and range seeding. The main limitations are depth to bedrock, steepness of slope, and the hazard of water erosion.

For general and detailed information about managing this map unit, see the following sections in Part II of this publication: Agronomy, Range, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

212—Teckla very fine sandy loam, 0 to 10 percent slopes

Setting

Elevation: 4,200 to 5,200 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 105 to 130 days

Major Component Description

Teckla and similar soils

Composition: 80 percent
Landform: Terrace
Landform Element: None assigned
Slope: 0 to 10 percent
Depth to Restrictive Feature: Strongly contrasting textural stratification: 20 to 40 inches
Drainage Class: Well drained
Parent Material: Alluvium and/or eolian deposits over residuum weathered from porcelanite
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 10 inches; very fine sandy loam
Bt—10 to 23 inches; sandy clay loam
2Bt—23 to 31 inches; channery loam
2Bk—31 to 45 inches; very channery loam
3C—45 to 60 inches; extremely channery sandy loam
Note: Permeability of the Teckla soil is moderate in the upper part of the subsoil and rapid in the substratum. Available water capacity is moderate. Effective rooting depth is 60 inches or more. Runoff is low. The hazard of water erosion is moderate. The hazard of wind erosion is severe.

Typical soil descriptions with range in characteristics are included, in alphabetical order, in the section Soil Series and Their Morphology.

Additional Components

Forkwood: 7 percent
Lawver: 7 percent
Wibaux: 6 percent

Use and Management

This unit is used primarily as rangeland and wildlife habitat.

This unit is poorly suited for stockwater ponds. The main limitation is the high potential for seepage losses.

This unit is moderately well suited for mechanical range renovation and range seeding. The main limitation for range seeding is the hazard of wind erosion. Mechanical range renovation may not be economically feasible due to the coarse texture of the surface layer. To reduce the hazard of wind erosion, adequate residue must be maintained on the surface at all times until the seeding is established. Tilled areas must remain narrow and at right angles to the wind. The low annual precipitation should be considered when planning a seeding.

For general and detailed information about managing this map unit, see the following sections in Part II of this publication: Agronomy, Range, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

213—Terro-Taluce sandy loams, 6 to 30 percent slopes

Setting

Elevation: 4,100 to 5,200 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 105 to 130 days

Major Component Description

Terro and similar soils

Composition: 55 percent
Landform: Hill, ridge
Landform Element: Backslope, summit
Slope: 6 to 30 percent
Depth to Restrictive Feature: Bedrock (paralithic): 20 to 40 inches
Drainage Class: Well drained
Parent Material: Alluvium over residuum weathered from calcareous sandstone
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 3 inches; sandy loam
Bt—3 to 19 inches; sandy loam
Bk—19 to 38 inches; sandy loam
Cr—38 to 60 inches; bedrock
Note: Permeability of the Terro soil is moderately rapid. Available water capacity is very low. Effective rooting depth is 20 to 40 inches. Runoff is low. The hazard of water and wind erosion is severe.

Taluce and similar soils

Composition: 25 percent
Landform: Hill, ridge
Landform Element: Summit, shoulder
Slope: 6 to 30 percent
Depth to Restrictive Feature: Bedrock (paralithic): 10 to 20 inches
Drainage Class: Well drained
Parent Material: Residuum weathered from calcareous sandstone
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 2 inches; sandy loam
C—2 to 14 inches; sandy loam
Cr—14 to 60 inches; bedrock
Note: Permeability of the Taluce soil is rapid. Available water capacity is very low. Effective rooting depth is 10 to 20 inches. Runoff is very high. The hazard of water and wind erosion is severe.

Typical soil descriptions with range in characteristics are included, in alphabetical order, in the section Soil Series and Their Morphology.

Additional Components

Keeline: 5 percent
Orpha: 5 percent
Turnercrest: 4 percent
Vonalee: 4 percent
Badland: 2 percent

Use and Management

This unit is used as rangeland and wildlife habitat.

This unit is poorly suited for stockwater ponds, mechanical range renovation, and range seeding. The main limitations are depth to bedrock, steepness of slope, and the hazard of water and wind erosion.

For general and detailed information about managing this map unit, see the following sections in Part II of this publication: Agronomy, Range, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

214—Theedle-Kishona loams, 0 to 6 percent slopes

Setting

Elevation: 4,100 to 5,200 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 105 to 130 days

Major Component Description

Theedle and similar soils

Composition: 50 percent
Landform: Hill, ridge
Landform Element: Summit, shoulder
Slope: 0 to 6 percent
Depth to Restrictive Feature: Bedrock (paralithic): 20 to 40 inches
Drainage Class: Well drained
Parent Material: Alluvium over residuum weathered from sandstone and shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 4 inches; loam
Bk—4 to 36 inches; clay loam
Cr—36 to 60 inches; bedrock
Note: Permeability of the Theedle soil is moderate. Available water capacity is moderate. Effective rooting depth is 20 to 40 inches. Runoff is medium. The hazard of water erosion is slight. The hazard of wind erosion is moderate.

Kishona and similar soils

Composition: 30 percent
Landform: Hill, ridge
Landform Element: Backslope, footslope
Slope: 0 to 6 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Parent Material: Alluvium derived from sandstone and shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 4 inches; loam
Bk—4 to 60 inches; clay loam
Note: Permeability of the Kishona soil is moderate. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is low. The hazard of water erosion is slight. The hazard of wind erosion is moderate.

Typical soil descriptions with range in characteristics are included, in alphabetical order, in the section Soil Series and Their Morphology.

Additional Components

Cambria: 5 percent
Cushman: 5 percent
Forkwood: 5 percent
Turnercrest: 5 percent

Use and Management

This unit is used primarily as rangeland and wildlife habitat.

The Theedle soil is poorly suited for stockwater ponds. The main limitation is depth to bedrock. The Kishona soil is moderately well suited for stockwater ponds. The main limitation is the moderate potential for seepage losses.

This unit is well suited for mechanical range renovation and range seeding. Adequate residue must be maintained on the surface at all times until the seeding is established. Tilled areas must remain narrow and at right angles to the wind. The low annual precipitation should be considered when planning a seeding.

For general and detailed information about managing this map unit, see the following sections in Part II of this publication: Agronomy, Range, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

215—Theedle-Kishona loams, 6 to 20 percent slopes

Setting

Elevation: 4,100 to 5,200 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 105 to 130 days

Major Component Description

Theedle and similar soils

Composition: 45 percent
Landform: Hill, ridge
Landform Element: Summit, shoulder
Slope: 6 to 20 percent
Depth to Restrictive Feature: Bedrock (paralithic): 20 to 40 inches
Drainage Class: Well drained
Parent Material: Alluvium over residuum weathered from sandstone and shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 4 inches; loam
Bk—4 to 36 inches; clay loam
Cr—36 to 60 inches; bedrock
Note: Permeability of the Theedle soil is moderate. Available water capacity is moderate. Effective rooting depth is 20 to 40 inches. Runoff is medium. The hazard of water erosion is severe. The hazard of wind erosion is moderate.

Kishona and similar soils

Composition: 30 percent
Landform: Hill, ridge
Landform Element: Backslope, footslope
Slope: 6 to 15 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Parent Material: Alluvium derived from sandstone and shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 4 inches; loam
Bk—4 to 60 inches; clay loam
Note: Permeability of the Kishona soil is moderate. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is medium. The hazard of water erosion is severe. The hazard of wind erosion is moderate.

Typical soil descriptions with range in characteristics are included, in alphabetical order, in the section Soil Series and Their Morphology.

Additional Components

Cushman: 5 percent
Savageton: 5 percent
Shingle: 5 percent
Silhouette: 5 percent
Zigweid: 5 percent

Use and Management

This unit is used as rangeland and wildlife habitat.

The Theedle soil is poorly suited for stockwater ponds. The main limitation is depth to bedrock. The Kishona soil is moderately well suited for stockwater ponds. The main limitations are the moderate potential for seepage losses and slope.

This unit is moderately well suited for mechanical range renovation and range seeding. The main limitation is the hazard of water erosion. To reduce the hazard of erosion, adequate residue must be maintained on the surface at all times until the seeding is established. Renovation and tillage for seeding should be along the contour of the slope. The use of tillage methods on areas with slopes greater than 15 percent is not recommended due to the hazard of water erosion. The low annual precipitation should be considered when planning a seeding.

For general and detailed information about managing this map unit, see the following sections in Part II of this publication: Agronomy, Range, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

216—Theedle-Kishona-Shingle loams, 3 to 30 percent slopes

Setting

Elevation: 4,100 to 5,200 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 105 to 130 days

Major Component Description

Theedle and similar soils

Composition: 40 percent
Landform: Hill, ridge
Landform Element: Summit, shoulder
Slope: 3 to 30 percent
Depth to Restrictive Feature: Bedrock (paralithic): 20 to 40 inches
Drainage Class: Well drained
Parent Material: Alluvium over residuum weathered from sandstone and shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 2 inches; loam
Bk—2 to 28 inches; clay loam
Cr—28 to 60 inches; bedrock
Note: Permeability of the Theedle soil is moderate. Available water capacity is moderate. Effective rooting depth is 20 to 40 inches. Runoff is medium. The hazard of water erosion is moderate to severe. The hazard of wind erosion is moderate.

Kishona and similar soils

Composition: 20 percent
Landform: Hill, ridge, fan remnant
Landform Element: Backslope, footslope
Slope: 3 to 15 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Parent Material: Alluvium derived from sandstone and shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 4 inches; loam
Bk—4 to 60 inches; clay loam
Note: Permeability of the Kishona soil is moderate. Available water capacity is very low. Effective rooting depth is 60 inches or more. Runoff is medium. The hazard of water erosion is severe. The hazard of wind erosion is moderate.

Shingle and similar soils

Composition: 20 percent
Landform: Hill, ridge
Landform Element: Summit, shoulder
Slope: 5 to 30 percent
Depth to Restrictive Feature: Bedrock (paralithic): 10 to 20 inches
Drainage Class: Well drained
Parent Material: Residuum weathered from sandstone and shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 2 inches; loam
C—2 to 12 inches; loam
Cr—12 to 60 inches; bedrock
Note: Permeability of the Shingle soil is moderate. Available water capacity is very low. Effective rooting depth is 10 to 20 inches. Runoff is very high The hazard of water erosion is severe. The hazard of wind erosion is moderate.

Typical soil descriptions with range in characteristics are included, in alphabetical order, in the section Soil Series and Their Morphology.

Additional Components

Cambria: 5 percent
Hilight: 5 percent
Taluce: 5 percent
Turnercrest: 5 percent

Use and Management

This unit is used as rangeland and wildlife habitat.

This unit is poorly suited for stockwater ponds. The main limitations are depth to bedrock and steepness of slope.

This unit is poorly suited for mechanical range renovation and range seeding. The main limitations

are slope and the hazard of water erosion. Tillage methods are not recommended.

For general and detailed information about managing this map unit, see the following sections in Part II of this publication: Agronomy, Range, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

217—Theedle-Shingle loams, 3 to 30 percent slopes

Setting

Elevation: 4,100 to 5,200 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 105 to 130 days

Major Component Description

Theedle and similar soils

Composition: 50 percent
Landform: Hill, ridge
Landform Element: Summit, shoulder
Slope: 3 to 30 percent
Depth to Restrictive Feature: Bedrock (paralithic): 20 to 40 inches
Drainage Class: Well drained
Parent Material: Alluvium over residuum weathered from sandstone and shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 2 inches; loam
Bk—2 to 28 inches; clay loam
Cr—28 to 60 inches; bedrock
Note: Permeability of the Theedle soil is moderate. Available water capacity is moderate. Effective rooting depth is 20 to 40 inches. Runoff is medium. The hazard of water erosion is severe. The hazard of wind erosion is moderate.

Shingle and similar soils

Composition: 30 percent
Landform: Hill, ridge
Landform Element: Summit, shoulder
Slope: 3 to 30 percent
Depth to Restrictive Feature: Bedrock (paralithic): 10 to 20 inches
Drainage Class: Well drained
Parent Material: Residuum weathered from sandstone and shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 2 inches; loam
C—2 to 12 inches; loam
Cr—12 to 60 inches; bedrock
Note: Permeability of the Shingle soil is moderate. Available water capacity is very low. Effective rooting depth is 10 to 20 inches. Runoff is very high. The hazard of water erosion is severe. The hazard of wind erosion is moderate.

Typical soil descriptions with range in characteristics are included, in alphabetical order, in the section Soil Series and Their Morphology.

Additional Components

Keeline: 5 percent
Kishona: 5 percent
Samday: 5 percent
Taluce: 5 percent

Use and Management

This unit is used as rangeland and wildlife habitat.

This unit is poorly suited for stockwater ponds, mechanical range renovation, and range seeding. The main limitations are depth to bedrock, steepness of slope, and the hazard of water erosion.

For general and detailed information about managing this map unit, see the following sections in Part II of this publication: Agronomy, Range, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

218—Theedle-Turnercrest-Kishona complex, 3 to 15 percent slopes

Setting

Elevation: 4,100 to 5,100 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 105 to 130 days

Major Component Description

Theedle and similar soils

Composition: 30 percent
Landform: Hill, ridge
Landform Element: Summit, shoulder
Slope: 3 to 15 percent

Depth to Restrictive Feature: Bedrock (paralithic): 20 to 40 inches
Drainage Class: Well drained
Parent Material: Alluvium over residuum weathered from sandstone and shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 3 inches; loam
Bk—3 to 35 inches; loam
Cr—35 to 60 inches; bedrock
Note: Permeability of the Theedle soil is moderate. Available water capacity is low. Effective rooting depth is 20 to 40 inches. Runoff is high. The hazard of water erosion is severe. The hazard of wind erosion is moderate.

Turnercrest and similar soils

Composition: 30 percent
Landform: Hill, ridge
Landform Element: Summit, shoulder
Slope: 3 to 15 percent
Depth to Restrictive Feature: Bedrock (paralithic): 20 to 40 inches
Drainage Class: Well drained
Parent Material: Alluvium and/or eolian deposits over residuum weathered from calcareous sandstone
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 2 inches; fine sandy loam
C—2 to 34 inches; fine sandy loam
Cr—34 to 60 inches; bedrock
Note: Permeability of the Turnercrest soil is moderately rapid. Available water capacity is low. Effective rooting depth is 20 to 40 inches. Runoff is low. The hazard of water erosion is moderate. The hazard of wind erosion is severe.

Kishona and similar soils

Composition: 20 percent
Landform: Hill, ridge
Landform Element: Backslope, footslope
Slope: 3 to 15 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Parent Material: Alluvium derived from sandstone and shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 4 inches; loam
Bk—4 to 60 inches; clay loam
Note: Permeability of the Kishona soil is moderate. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is low. The hazard of water erosion is severe. The hazard of wind erosion is moderate.

Typical soil descriptions with range in characteristics are included, in alphabetical order, in the section Soil Series and Their Morphology.

Additional Components

Areas with 15-20 percent slope: 4 percent
Jayem: 4 percent
Keeline: 4 percent
Taluce: 4 percent
Savageton: 2 percent
Shingle: 2 percent

Use and Management

This unit is used as rangeland and wildlife habitat.

The Theedle and Turnercrest soils are poorly suited for stockwater ponds. The main limitation is the depth to bedrock. The Kishona soil is moderately well suited for stockwater ponds. The main limitations are the moderate potential for seepage losses and slope.

The Theedle and Kishona soils are well suited and the Turnercrest soil is moderately well suited for mechanical range renovation. Mechanical range renovation may not be economically feasible on the Turnercrest soil due to the coarse texture of the surface layer.

This unit is moderately well suited for range seeding. The main limitation is the hazard of water and wind erosion. To reduce the hazard of erosion, adequate residue must be maintained on the surface at all times until the seeding is established. If practical, renovation and tillage for seeding should be along the contour of the slope. The low annual precipitation should be considered when planning a seeding.

For general and detailed information about managing this map unit, see the following sections in Part II of

this publication: Agronomy, Range, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

219—Torriarents-Torriorthents complex, reclaimed

Setting

Elevation: 4,100 to 5,000 feet
Mean annual precipitation: 10 to 16 inches
Frost-free period: 105 to 130 days

Major Component Description

Torriarents and similar soils

Composition: 50 percent
Landform: Hill, ridge
Landform Element: Summit, shoulder
Slope: 2 to 20 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Parent Material: Mine spoil or earthy fill derived from sandstone and shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 4 inches; variable
C—4 to 60 inches; variable
Notes: Permeability of the Torriarents is moderately slow. Available water capacity is high. Runoff is medium. The hazard of water erosion is severe. The hazard of wind erosion is moderate.

Torriorthents and similar soils

Composition: 50 percent
Landform: Hill, ridge
Landform Element: Summit, shoulder
Slope: 2 to 20 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Parent Material: Mine spoil or earthy fill derived from sandstone and shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 5 inches; variable
C—5 to 60 inches; variable

Typical soil descriptions with range in characteristics are included, in alphabetical order, in the section Soil Series and Their Morphology.

Use and Management

This unit is used for wildlife habitat and limited livestock grazing.

This unit responds well to fertilizer, range seeding, and proper grazing use. The main limitation for seeding is the hazard of water erosion. Adequate residue must be maintained on the surface at all times until the seeding is established. Management practices suitable for use on this unit include proper range use, deferred grazing, mowing, and rotation grazing. Livestock grazing should be managed to protect the soil from erosion.

For general and detailed information about managing this map unit, see the following sections in Part II of this publication: Agronomy, Range, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

220—Pitchdraw-Ashollow-Niobrara complex, 3 to 30 percent slopes

Setting

Elevation: 4,300 to 5,200 feet
Mean annual precipitation: 15 to 17 inches
Frost-free period: 105 to 130 days

Major Component Description

Pitchdraw and similar soils

Composition: 35 percent
Landform: Hill, ridge
Landform Element: Summit, shoulder
Slope: 3 to 30 percent
Depth to Restrictive Feature: Bedrock (paralithic): 20 to 40 inches
Drainage Class: Well drained
Parent Material: Alluvium and/or eolian deposits over residuum weathered from calcareous sandstone
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 4 inches; fine sandy loam
Bk—4 to 31 inches; fine sandy loam
Cr—31 to 60 inches; bedrock

Note: Permeability of the Pitchdraw soil is moderately rapid. Available water capacity is low. Effective rooting depth is 20 to 40 inches. Runoff is low. The hazard of water and wind erosion is severe.

Ashollow and similar soils

Composition: 25 percent
Landform: Hill, ridge
Landform Element: Backslope, footslope
Slope: 3 to 15 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Parent Material: Alluvium derived from calcareous sandstone and/or eolian deposits
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 5 inches; fine sandy loam
C—5 to 60 inches; fine sandy loam
Note: Permeability of the Ashollow soil is moderately rapid. Available water capacity is moderate. Effective rooting depth is 60 inches or more. Runoff is low. The hazard of water erosion is moderate. The hazard of wind erosion is severe.

Niobrara and similar soils

Composition: 20 percent
Landform: Hill, ridge
Landform Element: Summit, shoulder
Slope: 3 to 30 percent
Depth to Restrictive Feature: Bedrock (paralithic): 10 to 20 inches
Drainage Class: Excessively drained
Parent Material: Residuum weathered from sandstone
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 3 inches; loamy sand
C—3 to 12 inches; sand
Cr—12 to 60 inches; bedrock
Note: Permeability of the Niobrara soil is rapid. Available water capacity is very low. Effective rooting depth is 10 to 20 inches. Runoff is very high. The hazard of water and wind erosion is severe.

Typical soil descriptions with range in characteristics are included, in alphabetical order, in the section Soil Series and Their Morphology.

Additional Components

Elwop: 4 percent
Jayem: 4 percent
Vonalf: 4 percent
Xema: 4 percent
Badland: 2 percent
Blowouts: 2 percent

Use and Management

This unit is used primarily as rangeland and wildlife habitat.

This unit is poorly suited for stockwater ponds, mechanical range renovation, and range seeding. The main limitations for stockwater ponds are the high potential for seepage losses and steepness of slope. The depth to bedrock within the Turnercrest and Niobrara soils is a limitation for stockwater ponds. The main limitations for range seeding and range renovation are slope and the hazard of water and wind erosion.

For general and detailed information about managing this map unit, see the following sections in Part II of this publication: Agronomy, Range, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

221—Turnercrest-Keeline-Taluce fine sandy loams, 6 to 30 percent slopes

Setting

Elevation: 4,100 to 5,200 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 105 to 130 days

Major Component Description

Turnercrest and similar soils

Composition: 35 percent
Landform: Hill, ridge
Landform Element: Summit, shoulder
Slope: 6 to 30 percent
Depth to Restrictive Feature: Bedrock (paralithic): 20 to 40 inches
Drainage Class: Well drained
Parent Material: Alluvium and/or eolian deposits over residuum weathered from calcareous sandstone

Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 2 inches; fine sandy loam
C—2 to 32 inches; fine sandy loam
Cr—32 to 60 inches; bedrock
Note: Permeability of the Turnercrest soil is moderately rapid. Available water capacity is very low. Effective rooting depth is 20 to 40 inches. Runoff is medium. The hazard of water and wind erosion is severe.

Keeline and similar soils

Composition: 30 percent
Landform: Hill, ridge
Landform Element: Backslope, footslope
Slope: 6 to 20 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Parent Material: Alluvium and/or eolian deposits derived from calcareous sandstone
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 4 inches; fine sandy loam
C—4 to 60 inches; fine sandy loam
Note: Permeability of the Keeline soil is moderately rapid. Available water capacity is moderate. Effective rooting depth is 60 inches or more. Runoff is low. The hazard of water and wind erosion is severe.

Taluce and similar soils

Composition: 15 percent
Landform: Hill, ridge
Landform Element: Summit, shoulder
Slope: 6 to 30 percent
Depth to Restrictive Feature: Bedrock (paralithic): 10 to 20 inches
Drainage Class: Well drained
Parent Material: Residuum weathered from calcareous sandstone
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 2 inches; fine sandy loam
C—2 to 14 inches; fine sandy loam
Cr—14 to 60 inches; bedrock
Note: Permeability of the Taluce soil is rapid. Available water capacity is very low. Effective rooting depth is 10 to 20 inches. Runoff is very high. The hazard of water and wind erosion is severe.

Typical soil descriptions with range in characteristics are included, in alphabetical order, in the section Soil Series and Their Morphology.

Additional Components

Orpha: 5 percent
Terro: 5 percent
Tullock: 5 percent
Vonalee: 5 percent

Use and Management

This unit is used primarily as rangeland and wildlife habitat.

This unit is poorly suited for stockwater ponds, mechanical range renovation, and range seeding. The main limitations for stockwater ponds are the high potential for seepage losses and steepness of slope. The depth to bedrock within the Turnercrest and Taluce soils is also a limitation. The main limitations for range seeding and mechanical range renovation are the hazard of erosion and steepness of slope. Mechanical range renovation may not be economically feasible due to the low potential to increase the amount of forage on the Taluce soil and the coarse texture of the surface layer of all of the soils.

For general and detailed information about managing this map unit, see the following sections in Part II of this publication: Agronomy, Range, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

222—Turnercrest-Wibaux, thin solum-Taluce complex, 6 to 40 percent slopes

Setting

Elevation: 4,200 to 5,000 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 105 to 130 days

Major Component Description

Turnercrest and similar soils

Composition: 30 percent
Landform: Hill, ridge
Landform Element: Backslope, summit
Slope: 6 to 30 percent

Depth to Restrictive Feature: Bedrock (paralithic): 20 to 40 inches
Drainage Class: Well drained
Parent Material: Alluvium and/or eolian deposits over residuum weathered from calcareous sandstone
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 3 inches; loamy sand
C—3 to 22 inches; sandy loam
Cr—22 to 60 inches; bedrock
Note: Permeability of the Turnercrest soil is moderately rapid. Available water capacity is very low. Effective rooting depth is 20 to 40 inches. Runoff is low. The hazard of water and wind erosion is severe.

Wibaux, thin solum and similar soils

Composition: 30 percent
Landform: Hill, ridge
Landform Element: Summit, shoulder
Slope: 6 to 40 percent
Depth to Restrictive Feature: Strongly contrasting textural stratification: 6 to 10 inches
Drainage Class: Well drained
Parent Material: Alluvium and/or colluvium over residuum weathered from porcelanite
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 3 inches; very channery loam
C—3 to 9 inches; extremely channery loam
2C—9 to 60 inches; fragmental material
Note: Permeability of the Wibaux, thin solum soil is moderately rapid in the surface layer and very rapid in the underlying material. Available water capacity is very low. Effective rooting depth is variable due to the fractured nature of the porcelanite. Runoff is medium. The hazard of water erosion is moderate. The hazard of wind erosion is slight.

Taluce and similar soils

Composition: 20 percent
Landform: Hill, ridge
Landform Element: Summit, shoulder
Slope: 6 to 40 percent
Depth to Restrictive Feature: Bedrock (paralithic): 10 to 20 inches
Drainage Class: Well drained
Parent Material: Residuum weathered from calcareous sandstone
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 2 inches; sandy loam
C—2 to 14 inches; sandy loam
Cr—14 to 60 inches; bedrock
Note: Permeability of the Taluce soil is rapid. Available water capacity is very low. Effective rooting depth is 10 to 20 inches. Runoff is very high. The hazard of water and wind erosion is severe.

Typical soil descriptions with range in characteristics are included, in alphabetical order, in the section Soil Series and Their Morphology.

Additional Components

Keeline: 7 percent
Tullock: 7 percent
Badland: 4 percent
Areas with 40-60 percent slope: 2 percent

Use and Management

This unit is used as rangeland and wildlife habitat.

This unit is poorly suited for stockwater ponds, mechanical range renovation, and range seeding. The main limitations for stockwater ponds are slope and the depth to bedrock. The main limitations for range seeding and mechanical range renovation are slope and the hazard of erosion. Tillage methods are not recommended.

For general and detailed information about managing this map unit, see the following sections in Part II of this publication: Agronomy, Range, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

223—Ucross loam, 1 to 9 percent slopes

Setting

Elevation: 4,300 to 4,800 feet
Mean annual precipitation: 15 to 17 inches
Frost-free period: 105 to 130 days

Major Component Description

Ucross and similar soils

Composition: 80 percent

Landform: Hill, ridge
Landform Element: Summit, shoulder
Slope: 1 to 9 percent
Depth to Restrictive Feature: Bedrock (paralithic): 20 to 40 inches
Drainage Class: Well drained
Parent Material: Alluvium over residuum weathered from sandstone and shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 5 inches; loam
Bk—5 to 31 inches; clay loam
Cr—31 to 60 inches; bedrock
Note: Permeability of the Ucross soil is moderate. Available water capacity is moderate. Effective rooting depth is 20 to 40 inches. Runoff is medium. The hazard of water and wind erosion is moderate.

Typical soil descriptions with range in characteristics are included, in alphabetical order, in the section Soil Series and Their Morphology.

Additional Components

Cromack: 7 percent
Fairburn: 7 percent
Iwait: 6 percent

Use and Management

This unit is used as rangeland, nonirrigated hayland and pasture, and wildlife habitat.

This unit is poorly suited for stockwater ponds. The main limitation is depth to bedrock.

This unit is well suited for mechanical range renovation and moderately well suited for range seeding. The main limitation for range seeding is the hazard of water and wind erosion. To reduce the hazard of erosion, adequate residue must be maintained on the surface at all times until the seeding is established. Tilled areas must remain narrow and at right angles to the wind. The low annual precipitation should be considered when planning a seeding.

This unit is moderately well suited for nonirrigated hayland and pasture. The main limitation is low annual precipitation. Proper stocking rates, pasture rotation, and restricted grazing during wet periods help to keep the pasture in good condition.

For general and detailed information about managing this map unit, see the following sections in Part II of this publication: Agronomy, Range, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

224—Ucross-Iwait loams, 0 to 6 percent slopes

Setting

Elevation: 4,300 to 4,800 feet
Mean annual precipitation: 15 to 17 inches
Frost-free period: 105 to 130 days

Major Component Description

Ucross and similar soils

Composition: 50 percent
Landform: Hill, ridge
Landform Element: Summit, shoulder
Slope: 0 to 6 percent
Depth to Restrictive Feature: Bedrock (paralithic): 20 to 40 inches
Drainage Class: Well drained
Parent Material: Alluvium over residuum weathered from sandstone and shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 5 inches; loam
Bk—5 to 31 inches; clay loam
Cr—31 to 60 inches; bedrock
Note: Permeability of the Ucross soil is moderate. Available water capacity is moderate. Effective rooting depth is 20 to 40 inches. Runoff is medium. The hazard of water erosion is slight. The hazard of wind erosion is moderate.

Iwait and similar soils

Composition: 30 percent
Landform: Fan remnant
Landform Element: None assigned
Slope: 0 to 6 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Parent Material: Alluvium derived from sandstone and shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet

Ponding: None
Typical profile:
A—0 to 6 inches; loam
Bk—6 to 60 inches; clay loam
Note: Permeability of the Iwait soil is moderate. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is low. The hazard of water erosion is slight. The hazard of wind erosion is moderate.

Typical soil descriptions with range in characteristics are included, in alphabetical order, in the section Soil Series and Their Morphology.

Additional Components

Cromack: 7 percent
Ziggy: 7 percent
Oldwolf: 6 percent

Use and Management

This unit is used as rangeland, nonirrigated hayland and pasture, and wildlife habitat.

The Ucross soil is poorly suited for stockwater ponds. The main limitation is depth to bedrock. The Iwait soil is moderately well suited for stockwater ponds. The main limitation is the moderate potential for seepage losses.

This unit is well suited for mechanical range renovation and range seeding. Adequate residue must be maintained on the surface at all times until the seeding is established. Tilled areas must remain narrow and at right angles to the wind. The low annual precipitation should be considered when planning a seeding.

This unit is moderately well suited for nonirrigated hayland and pasture. The main limitation is low annual precipitation. Proper stocking rates, pasture rotation, and restricted grazing during wet periods help to keep the pasture in good condition.

For general and detailed information about managing this map unit, see the following sections in Part II of this publication: Agronomy, Range, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

225—Ucross-Iwait-Fairburn loams, 3 to 30 percent slopes

Setting

Elevation: 4,300 to 5,000 feet
Mean annual precipitation: 15 to 17 inches
Frost-free period: 105 to 130 days

Major Component Description

Ucross and similar soils

Composition: 35 percent
Landform: Hill, ridge
Landform Element: Summit, shoulder
Slope: 3 to 30 percent
Depth to Restrictive Feature: Bedrock (paralithic): 20 to 40 inches
Drainage Class: Well drained
Parent Material: Alluvium over residuum weathered from sandstone and shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 5 inches; loam
Bk—5 to 31 inches; clay loam
Cr—31 to 60 inches; bedrock
Note: Permeability of the Ucross soil is moderate. Available water capacity is moderate. Effective rooting depth is 20 to 40 inches. Runoff is high. The hazard of water erosion is severe. The hazard of wind erosion is moderate.

Iwait and similar soils

Composition: 25 percent
Landform: Hill, ridge, fan remnant
Landform Element: Backslope, footslope
Slope: 3 to 20 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Parent Material: Alluvium derived from sandstone and shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 6 inches; loam
Bk—6 to 60 inches; clay loam
Note: Permeability of the Iwait soil is moderate. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is medium. The hazard of water erosion is severe. The hazard of wind erosion is moderate.

Fairburn and similar soils

Composition: 20 percent
Landform: Hill, ridge
Landform Element: Summit, shoulder
Slope: 5 to 30 percent
Depth to Restrictive Feature: Bedrock (paralithic): 10 to 20 inches
Drainage Class: Well drained
Parent Material: Residuum weathered from sandstone and shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 4 inches; loam
C—4 to 15 inches; loam
Cr—15 to 60 inches; bedrock
Note: Permeability of the Fairburn soil is moderate. Available water capacity is very low. Effective rooting depth is 10 to 20 inches. Runoff is very high. The hazard of water erosion is severe. The hazard of wind erosion is moderate.

Typical soil descriptions with range in characteristics are included, in alphabetical order, in the section Soil Series and Their Morphology.

Additional Components

Cromack: 4 percent
Deekay: 4 percent
Mittenbutte: 4 percent
Pitchdraw: 4 percent
Ziggy: 4 percent

Use and Management

This unit is used as rangeland and wildlife habitat.

This unit is poorly suited for stockwater ponds. The main limitation is depth to bedrock and steepness of slope.

This unit is poorly suited for mechanical range renovation and range seeding. The main limitations are slope and the hazard of water erosion. The use of tillage methods is not recommended due to the hazard of water erosion and steepness of slope. The low annual precipitation should be considered when planning a seeding.

For general and detailed information about managing this map unit, see the following sections in Part II of this publication: Agronomy, Range, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

226—Ulm loam, 0 to 6 percent slopes

Setting

Elevation: 4,100 to 5,000 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 105 to 130 days

Major Component Description

Ulm and similar soils

Composition: 85 percent
Landform: Alluvial fan, fan remnant
Landform Element: None assigned
Slope: 0 to 6 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Parent Material: Alluvium derived from calcareous shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 2 inches; loam
Bt—2 to 25 inches; clay loam
Bk—25 to 60 inches; clay loam
Note: Permeability of the Ulm soil is slow. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is medium. The hazard of water erosion is slight. The hazard of wind erosion is moderate.

Typical soil descriptions with range in characteristics are included, in alphabetical order, in the section Soil Series and Their Morphology.

Additional Components

Bidman: 8 percent
Forkwood: 7 percent

Use and Management

This unit is used primarily as rangeland, nonirrigated hayland and pasture, and wildlife habitat.

This soil is well suited for stockwater ponds, mechanical range renovation, and range seeding. Adequate residue must be maintained on the surface at all times until the seeding is established. The low

annual precipitation should be considered when planning a seeding.

This unit is moderately well suited for nonirrigated hayland and pasture. The main limitation is low annual precipitation. Proper stocking rates, pasture rotation, and restricted grazing during wet periods help to keep the pasture in good condition.

For general and detailed information about managing this map unit, see the following sections in Part II of this publication: Agronomy, Range, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

227—Ulm clay loam, 0 to 6 percent slopes

Setting

Elevation: 4,100 to 5,200 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 105 to 130 days

Major Component Description

Ulm and similar soils

Composition: 85 percent
Landform: Alluvial fan, fan remnant
Landform Element: None assigned
Slope: 0 to 6 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Parent Material: Alluvium derived from calcareous shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 4 inches; clay loam
Bt—4 to 25 inches; clay
Bk—25 to 60 inches; clay loam
Note: Permeability of the Ulm soil is slow. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is to medium. The hazard of water and wind erosion is moderate.

Typical soil descriptions with range in characteristics are included, in alphabetical order, in the section Soil Series and Their Morphology.

Additional Components

Bidman: 5 percent
Heldt: 5 percent
Wyarno: 5 percent

Use and Management

This unit is used primarily as rangeland, nonirrigated hayland and pasture, and wildlife habitat.

This soil is well suited for stockwater ponds and mechanical range renovation. It is moderately well suited to range seeding. The main limitation is the hazard of erosion. To reduce the hazard of erosion, adequate residue must be maintained on the surface at all times until the seeding is established. Tilled areas must remain narrow and at right angles to the wind. The low annual precipitation should be considered when planning a seeding.

This unit is moderately well suited for nonirrigated hayland and pasture. The main limitation is low annual precipitation. Proper stocking rates, pasture rotation, and restricted grazing during wet periods help to keep the pasture in good condition.

For general and detailed information about managing this map unit, see the following sections in Part II of this publication: Agronomy, Range, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

228—Ulm-Renohill clay loams, 0 to 6 percent slopes

Setting

Elevation: 4,100 to 5,200 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 105 to 130 days

Major Component Description

Ulm and similar soils

Composition: 50 percent
Landform: Hill, ridge
Landform Element: Backslope, footslope
Slope: 0 to 6 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Parent Material: Alluvium derived from calcareous shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None

Typical profile:
A—0 to 4 inches; clay loam
Bt—4 to 25 inches; clay
Bk—25 to 60 inches; clay loam
Note: Permeability of the Ulm soil is slow. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is medium. The hazard of water erosion is slight. The hazard of wind erosion is moderate.

Renohill and similar soils

Composition: 30 percent
Landform: Hill, ridge
Landform Element: Summit, shoulder
Slope: 0 to 6 percent
Depth to Restrictive Feature: Bedrock (paralithic): 20 to 40 inches
Drainage Class: Well drained
Parent Material: Alluvium over residuum weathered from calcareous shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 4 inches; clay loam
Bt—4 to 24 inches; clay
Bk—24 to 35 inches; clay loam
Cr—35 to 60 inches; bedrock
Note: Permeability of the Renohill soil is slow. Available water capacity is moderate. Effective rooting depth is 20 to 40 inches. Runoff is medium. The hazard of water and wind erosion is moderate.

Typical soil descriptions with range in characteristics are included, in alphabetical order, in the section Soil Series and Their Morphology.

Additional Components

Bidman: 4 percent
Parmleed: 4 percent
Savageton: 3 percent

Use and Management

This unit is used as rangeland and wildlife habitat.

The Ulm soil is well suited and the Renohill soil is poorly suited for stockwater ponds. The main limitation is depth to bedrock.

This unit is well suited for mechanical range renovation and range seeding. To reduce the hazard of wind erosion, adequate residue must be maintained on the surface at all times until the seeding is established. Tilled areas must remain narrow and at right angles to the wind. The low annual precipitation should be considered when planning a seeding.

For general and detailed information about managing this map unit, see the following sections in Part II of this publication: Agronomy, Range, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

229—Ulm-Renohill clay loams, 6 to 15 percent slopes

Setting

Elevation: 4,100 to 5,200 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 105 to 130 days

Major Component Description

Ulm and similar soils

Composition: 50 percent
Landform: Hill, ridge
Landform Element: Backslope, footslope
Slope: 6 to 15 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Parent Material: Alluvium derived from calcareous shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 4 inches; clay loam
Bt—4 to 25 inches; clay
Bk—25 to 60 inches; clay loam
Note: Permeability of the Ulm soil is slow. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is high. The hazard of water erosion is severe. The hazard of wind erosion is moderate.

Renohill and similar soils

Composition: 30 percent
Landform: Hill, ridge
Landform Element: Summit, shoulder
Slope: 6 to 15 percent
Depth to Restrictive Feature: Bedrock (paralithic): 20 to 40 inches

Drainage Class: Well drained
Parent Material: Alluvium over residuum weathered from calcareous shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 4 inches; clay loam
Bt—4 to 24 inches; clay
Bk—24 to 35 inches; clay loam
Cr—35 to 60 inches; bedrock
Note: Permeability of the Renohill soil is slow. Available water capacity is moderate. Effective rooting depth is 20 to 40 inches. Runoff is high. The hazard of water erosion is severe. The hazard of wind erosion is moderate.

Typical soil descriptions with range in characteristics are included, in alphabetical order, in the section Soil Series and Their Morphology.

Additional Components

Bidman: 5 percent
Parmleed: 5 percent
Savageton: 5 percent
Worlka: 5 percent

Use and Management

This unit is used as rangeland and wildlife habitat.

The Ulm soil is moderately well suited for stockwater ponds. The main limitation is slope. The Renohill soil is poorly suited for stockwater ponds. The main limitation is depth to bedrock.

This unit is well suited for mechanical range renovation and moderately well suited for range seeding. The main limitation for range seeding is the hazard of water erosion. To reduce the hazard of erosion, adequate residue must be maintained on the surface at all times until the seeding is established. Renovation and tillage for seeding should be along the contour of the slope. The low annual precipitation should be considered when planning a seeding.

For general and detailed information about managing this map unit, see the following sections in Part II of this publication: Agronomy, Range, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

230—Urban land-Deekay-Moorhead complex, 0 to 6 percent slopes

Setting

Elevation: 4,300 to 4,600 feet
Mean annual precipitation: 15 to 17 inches
Frost-free period: 105 to 130 days

Major Component Description

Urban land

Composition: 40 percent
Landform: Alluvial fan, fan remnant
Landform Element: None assigned
Slope: —-
Depth to Restrictive Feature: None noted
Drainage Class: —-
Parent Material: Mine spoil or earthy fill derived from sandstone and shale
Flooding: —-
Water Table: No water table exists above a depth of 6 feet
Ponding: No seasonal ponding exists
Note: Urban land is land where most of the surface is covered by streets, parking lots, buildings, and other structures of urban areas. In areas where the surface is not covered, the original soil has commonly been altered by excavation or built-up with fill from various sources.

Deekay and similar soils

Composition: 25 percent
Landform: Alluvial fan, fan remnant
Landform Element: None assigned
Slope: 0 to 6 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Parent Material: Alluvium derived from sandstone and shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 4 inches; loam
Bt—4 to 23 inches; clay loam
Bk—23 to 60 inches; loam
Note: Permeability of the Deekay soil is moderate. Available water capacity is high.

Effective rooting depth is 60 inches or more. Runoff is low. The hazard of water erosion is slight. The hazard of wind erosion is moderate.

Moorhead and similar soils

Composition: 25 percent
Landform: Alluvial fan, fan remnant
Landform Element: None assigned
Slope: 0 to 6 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Parent Material: Alluvium derived from calcareous shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 6 inches; clay loam
Bt—6 to 24 inches; clay
Bk—24 to 60 inches; clay loam
Note: Permeability of the Moorhead soil is slow. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is medium. The hazard of water erosion is slight to moderate. The hazard of wind erosion is moderate.

Typical soil descriptions with range in characteristics are included, in alphabetical order, in the section Soil Series and Their Morphology.

Additional Components

Echeta: 3 percent
Jaywest: 3 percent
Felix, ponded: 2 percent
Ucross: 2 percent

Use and Management

This unit is used mainly for housing, urban development, and recreation.

This unit is moderately well suited for urban development. The main limitations of the Deekay and Moorhead soils are low strength and moderate shrink-swell potential. Buildings and roads should be designed to offset the limited ability of these soils to support a load. The effects of shrinking and swelling on these soils can be minimized by using proper engineering designs and backfilling with material that has low shrink-swell potential.

For general and detailed information about managing this map unit, see the following sections in Part II of this publication: Agronomy, Range, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

231—Urban land-Leiter-Moorhead complex, 3 to 10 percent slopes

Setting

Elevation: 4,300 to 4,600 feet
Mean annual precipitation: 15 to 17 inches
Frost-free period: 105 to 130 days

Major Component Description

Urban land

Composition: 45 percent
Landform: Hill, ridge
Landform Element: Backslope, footslope
Slope: —
Depth to Restrictive Feature: None noted
Drainage Class: —
Parent Material: Mine spoil or earthy fill derived from sandstone and shale
Flooding: —
Water Table: No water table exists above a depth of 6 feet
Ponding: No seasonal ponding exists
Note: Urban land is land where most of the surface is covered by streets, parking lots, buildings, and other structures of urban areas. In areas where the surface is not covered, the original soil has commonly been altered by excavation or built-up with fill from various sources.

Leiter and similar soils

Composition: 25 percent
Landform: Hill, ridge
Landform Element: Summit, shoulder
Slope: 3 to 10 percent
Depth to Restrictive Feature: Bedrock (paralithic): 20 to 40 inches
Drainage Class: Well drained
Parent Material: Alluvium over residuum weathered from calcareous shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 3 inches; clay loam
Bt—3 to 22 inches; clay
Bk—22 to 33 inches; clay loam

Cr—33 to 60 inches; bedrock
Note: Permeability of the Leiter soil is slow. Available water capacity is moderate. Effective rooting depth is 20 to 40 inches. Runoff is high. The hazard of water erosion is severe. The hazard of wind erosion is moderate.

Moorhead and similar soils

Composition: 20 percent
Landform: Hill, ridge
Landform Element: Backslope, footslope
Slope: 3 to 10 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Parent Material: Alluvium derived from calcareous shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 4 inches; clay loam
Bt—4 to 24 inches; clay
Bk—24 to 60 inches; clay loam
Note: Permeability of the Moorhead soil is slow. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is high. The hazard of water erosion is severe. The hazard of wind erosion is moderate.

Typical soil descriptions with range in characteristics are included, in alphabetical order, in the section Soil Series and Their Morphology.

Additional Components

Cromack: 5 percent
Deekay: 5 percent

Use and Management

This unit is used mainly for housing, urban development, and recreation.

This unit is moderately well suited for urban development. The main limitations of the Leiter and Moorhead soils are low strength, moderate shrink-swell potential, and slope. The Leiter soil is also limited by depth to bedrock. Buildings and roads should be designed to offset the limited ability of the soils in this unit to support a load. The possibility of settlement can be minimized by compacting the building site before construction begins. The effects of shrinking and swelling on these soils can be minimized by using proper engineering designs and by backfilling with material that has low shrink-swell potential. Diverting runoff away from buildings helps prevent structural damage caused by shrinking and swelling. The deep cuts needed to provide essentially level building sites on the Leiter soil can expose bedrock.

For general and detailed information about managing this map unit, see the following sections in Part II of this publication: Agronomy, Range, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

232—Urban land-Pitchdraw-Ashollow complex, 6 to 15 percent slopes

Setting

Elevation: 4,300 to 4,600 feet
Mean annual precipitation: 14 to 17 inches
Frost-free period: 105 to 130 days

Major Component Description

Urban land

Composition: 45 percent
Landform: Hill, ridge
Landform Element: Backslope, footslope
Slope: —
Depth to Restrictive Feature: None noted
Drainage Class: —
Parent Material: Mine spoil or earthy fill derived from sandstone and shale
Flooding: —
Water Table: No water table exists above a depth of 6 feet
Ponding: No seasonal ponding exists
Note: Urban land is land where most of the surface is covered by streets, parking lots, buildings, and other structures of urban areas. In areas where the surface is not covered, the original soil has commonly been altered by excavation or built-up with fill from various sources.

Pitchdraw and similar soils

Composition: 25 percent
Landform: Hill, ridge
Landform Element: Summit, shoulder
Slope: 6 to 15 percent
Depth to Restrictive Feature: Bedrock (paralithic): 20 to 40 inches
Drainage Class: Well drained
Parent Material: Alluvium and/or eolian deposits

over residuum weathered from calcareous sandstone
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 4 inches; fine sandy loam
Bk—4 to 31 inches; fine sandy loam
Cr—31 to 60 inches; bedrock
Note: Permeability of the Pitchdraw soil is moderately rapid. Available water capacity is low. Effective rooting depth is 20 to 40 inches. Runoff is low. The hazard of water and wind erosion is severe.

Ashollow and similar soils

Composition: 20 percent
Landform: Hill, ridge
Landform Element: Backslope, footslope
Slope: 6 to 15 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Parent Material: Eolian deposits over alluvium derived from calcareous sandstone
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 5 inches; fine sandy loam
C—5 to 60 inches; fine sandy loam
Note: Permeability of the Ashollow soil is moderately rapid. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is low. The hazard of water and wind erosion is severe.

Typical soil descriptions with range in characteristics are included, in alphabetical order, in the section Soil Series and Their Morphology.

Additional Components

Arwite: 2 percent
Valent: 2 percent
Elwop: 2 percent
Mittenbutte: 2 percent
Areas with 15-20 percent slope: 1 percent
Areas with 3-6 percent slope: 1 percent

Use and Management

This unit is used mainly for housing, urban development, and recreation.

The Turnercrest soil is moderately suited for urban development. The main limitation is the depth to bedrock. The Keeline soil is moderately well suited to urban development. The main limitation is slope. Excavation for houses and access roads exposes material that is highly susceptible to wind erosion. Revegetating disturbed areas around construction sites as soon as possible helps to control erosion. The deep cuts needed to provide essentially level sites on the Turnercrest soil can create exposed areas of bedrock.

For general and detailed information about managing this map unit, see the following sections in Part II of this publication: Agronomy, Range, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

233—Ustic Torriorthents, gullied

Setting

Elevation: 4,100 to 5,200 feet
Mean annual precipitation: 10 to 17 inches
Frost-free period: 105 to 130 days

Major Component Description

Ustic Torriorthents and similar soils

Composition: 80 percent
Landform: Hill, ridge
Landform Element: Summit, shoulder
Slope: 10 to 80 percent
Depth to Restrictive Feature: Bedrock (paralithic): 20 to 60 inches
Drainage Class: Well drained
Parent Material: Alluvium and/or residuum weathered from sandstone and shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 4 inches; loam
Bk—4 to 35 inches; clay loam
Cr—35 to 60 inches; bedrock
Note: These soils are highly variable within a delineation and from one delineation to another. Textures of the surface and underlying material are variable and range from loamy fine sand to clay.

Permeability of the Ustic Torriorthents, gullied soil ranges from moderately slow to moderately rapid. Available water capacity is

high. Runoff is very high. The hazard of water and wind erosion is severe.

Typical soil descriptions with range in characteristics are included, in alphabetical order, in the section Soil Series and Their Morphology.

Additional Components

Haverdad: 5 percent
Kishona: 5 percent
Shingle: 5 percent
Theedle: 5 percent

Use and Management

This unit is used as rangeland and wildlife habitat.

This unit is poorly suited for stockwater ponds, mechanical range renovation, and range seeding. The main limitation for stockwater ponds is steepness of slope. The main limitations for mechanical range renovation and range seeding are steepness of slope and the hazard of erosion.

For general and detailed information about managing this map unit, see the following sections in Part II of this publication: Agronomy, Range, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

234—Ustic Torriorthents-Badland complex, 10 to 100 percent slopes

Setting

Elevation: 4,100 to 5,200 feet
Mean annual precipitation: 10 to 17 inches
Frost-free period: 105 to 130 days

Major Component Description

Ustic Torriorthents and similar soils

Composition: 65 percent
Landform: Hill, ridge
Landform Element: Summit, shoulder
Slope: 10 to 80 percent
Depth to Restrictive Feature: Bedrock (paralithic): 20 to 60 inches
Drainage Class: Well drained
Parent Material: Alluvium and/or residuum weathered from sandstone and shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None

Typical profile:
A—0 to 4 inches; loam
Bk—4 to 35 inches; clay loam
Cr—35 to 60 inches; bedrock
Note: These soils are highly variable within a delineation and from one delineation to another. Textures of the surface and underlying material are variable and range from loamy fine sand to clay.

Permeability of the Ustic Torriorthents, gullied soil ranges from moderately slow to moderately rapid. Available water capacity is high. Runoff is very high. The hazard of water and wind erosion is severe.

Badland

Composition: 20 percent
Landform: Hill, ridge
Landform Element: Summit, shoulder
Slope: —-
Depth to Restrictive Feature: Bedrock (paralithic): 0 to 0 inches
Drainage Class: —-
Parent Material: Residuum weathered from sandstone and shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Note: Badland consists of exposures of sandstone, shale, or consolidated porcelanite.

Typical soil descriptions with range in characteristics are included, in alphabetical order, in the section Soil Series and Their Morphology.

Additional Components

Samday: 5 percent
Shingle: 5 percent
Taluce: 5 percent
Theedle: 5 percent

Use and Management

This unit is used as rangeland and wildlife habitat.

This unit is poorly suited for stockwater ponds, mechanical range renovation, and range seeding. The main limitation is steepness of slope.

For general and detailed information about managing this map unit, see the following sections in Part II of this publication: Agronomy, Range,

Recreation, Wildlife Habitat, Engineering, and Soil Properties.

235—Vonalee fine sandy loam, 0 to 10 percent slopes

Setting

Elevation: 4,100 to 5,200 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 105 to 130 days

Major Component Description

Vonalee and similar soils

Composition: 80 percent
Landform: Alluvial fan, fan remnant
Landform Element: None assigned
Slope: 0 to 10 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Parent Material: Alluvium and/or eolian deposits derived from calcareous sandstone
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 3 inches; fine sandy loam
Bt—3 to 24 inches; fine sandy loam
Bk—24 to 60 inches; fine sandy loam
Note: Permeability of the Vonalee soil is moderately rapid. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is very low. The hazard of water erosion is moderate. The hazard of wind erosion is severe.

Additional Components

Hiland: 6 percent
Keeline: 6 percent
Terro: 6 percent
Areas with 10-15 percent slope: 2 percent

Use and Management

This unit is used as rangeland, nonirrigated hayland and pasture, and wildlife habitat.

This unit is poorly suited for stockwater ponds. The main limitation is the high potential for seepage losses.

This unit is moderately well suited for mechanical range renovation and range seeding. The main limitation for range seeding is the hazard of wind erosion. Mechanical range renovation may not be economically feasible due to the coarse texture of the surface layer. To reduce the hazard of wind erosion, adequate residue must be maintained on the surface at all times until the seeding is established. Tilled areas must remain narrow and at right angles to the wind. The low annual precipitation should be considered when planning a seeding.

This unit is moderately well suited for nonirrigated hayland and pasture. The main limitation is low annual precipitation and the droughtiness of the soils. Proper stocking rates, pasture rotation, and restricted grazing during wet periods help to keep the pasture in good condition.

For general and detailed information about managing this map unit, see the following sections in Part II of this publication: Agronomy, Range, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

236—Vonalee-Terro fine sandy loams, 2 to 10 percent slopes

Setting

Elevation: 4,100 to 5,000 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 105 to 130 days

Major Component Description

Vonalee and similar soils

Composition: 50 percent
Landform: Hill, ridge
Landform Element: Backslope, footslope
Slope: 2 to 10 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Parent Material: Alluvium and/or eolian deposits derived from calcareous sandstone
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 3 inches; fine sandy loam
Bt—3 to 24 inches; fine sandy loam
Bk—24 to 60 inches; fine sandy loam
Note: Permeability of the Vonalee soil is moderately rapid. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is very low. The hazard of water

erosion is moderate. The hazard of wind erosion is severe.

Terro and similar soils

Composition: 30 percent
Landform: Hill, ridge
Landform Element: Summit, shoulder
Slope: 2 to 10 percent
Depth to Restrictive Feature: Bedrock (paralithic): 20 to 40 inches
Drainage Class: Well drained
Parent Material: Alluvium over residuum weathered from calcareous sandstone
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 3 inches; fine sandy loam
Bt—3 to 16 inches; fine sandy loam
Bk—16 to 30 inches; fine sandy loam
Cr—30 to 60 inches; bedrock
Note: Permeability of the Terro soil is moderately rapid. Available water capacity is low. Effective rooting depth is 20 to 40 inches. Runoff is low. The hazard of water erosion is moderate. The hazard of wind erosion is severe.

Typical soil descriptions with range in characteristics are included, in alphabetical order, in the section Soil Series and Their Morphology.

Additional Components

Bowbac: 5 percent
Orpha: 5 percent
Taluce: 5 percent
Tullock: 4 percent
Areas with 10-15 percent slope: 1 percent

Use and Management

This unit is used primarily as rangeland and wildlife habitat.

This unit is poorly suited for stockwater ponds. The main limitations are the depth to bedrock within the Terro soil and the high potential of both soils for seepage losses.

This unit is moderately well suited for mechanical range renovation and range seeding. The main limitation for range seeding is the hazard of wind erosion. Mechanical range renovation may not be economically feasible due to the coarse texture of the surface layer. To reduce the hazard of wind erosion, adequate residue must be maintained on the surface at all times until the seeding is established. Tilled areas must remain narrow and at right angles to the wind. The low annual precipitation should be considered when planning a seeding.

For general and detailed information about managing this map unit, see the following sections in Part II of this publication: Agronomy, Range, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

237—Vonalf fine sandy loam, 0 to 6 percent slopes

Setting

Elevation: 4,300 to 4,800 feet
Mean annual precipitation: 15 to 17 inches
Frost-free period: 105 to 130 days

Major Component Description

Vonalf and similar soils

Composition: 85 percent
Landform: Alluvial fan, fan remnant
Landform Element: None assigned
Slope: 0 to 6 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Parent Material: Alluvium and/or eolian deposits derived from calcareous sandstone
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 6 inches; fine sandy loam
Bt—6 to 34 inches; fine sandy loam
Bk—34 to 60 inches; fine sandy loam
Note: Permeability of the Vonalf soil is moderately rapid. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is very low. The hazard of water erosion is slight. The hazard of wind erosion is severe.

Typical soil descriptions with range in characteristics are included, in alphabetical order, in the section Soil Series and Their Morphology.

Additional Components

Arwite: 5 percent
Jayem: 5 percent
Xema: 5 percent

Use and Management

This unit is used primarily as rangeland, nonirrigated hayland and pasture, and wildlife habitat.

This unit is poorly suited for stockwater ponds. The main limitation is the high potential for seepage losses.

This unit is moderately well suited for mechanical range renovation and range seeding. The main limitation for range seeding is the hazard of wind erosion. Mechanical range renovation may not be economically feasible due to the coarse texture of the surface layer. To reduce the hazard of wind erosion, adequate residue must be maintained on the surface at all times until the seeding is established. Tilled areas must remain narrow and at right angles to the wind. The low annual precipitation should be considered when planning a seeding.

This unit is moderately well suited for nonirrigated hayland and pasture. The main limitation is low annual precipitation and the droughtiness of the soil. Rotation grazing maintains optimum vigor and quality of forage.

For general and detailed information about managing this map unit, see the following sections in Part II of this publication: Agronomy, Range, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

238—Vonalf-Xema fine sandy loams, 3 to 10 percent slopes

Setting

Elevation: 4,300 to 4,800 feet
Mean annual precipitation: 15 to 17 inches
Frost-free period: 105 to 130 days

Major Component Description

Vonalf and similar soils

Composition: 50 percent
Landform: Hill, ridge
Landform Element: Backslope, footslope
Slope: 3 to 10 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Parent Material: Alluvium and/or eolian deposits derived from calcareous sandstone
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 6 inches; fine sandy loam
Bt—6 to 34 inches; fine sandy loam
Bk—34 to 60 inches; fine sandy loam
Note: Permeability of the Vonalf soil is moderately rapid. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is very low. The hazard of water erosion is moderate. The hazard of wind erosion is severe.

Xema and similar soils

Composition: 30 percent
Landform: Hill, ridge
Landform Element: Summit, shoulder
Slope: 3 to 10 percent
Depth to Restrictive Feature: Bedrock (paralithic): 20 to 40 inches
Drainage Class: Well drained
Parent Material: Alluvium and/or eolian deposits over residuum weathered from calcareous sandstone
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 4 inches; fine sandy loam
Bt—4 to 22 inches; fine sandy loam
Bk—22 to 31 inches; fine sandy loam
Cr—31 to 60 inches; bedrock
Note: Permeability of the Xema soil is moderately rapid. Available water capacity is low. Effective rooting depth is 20 to 40 inches. Runoff is low. The hazard of water erosion is moderate. The hazard of wind erosion is severe.

Typical soil descriptions with range in characteristics are included, in alphabetical order, in the section Soil Series and Their Morphology.

Additional Components

Arwite: 6 percent
Ashollow: 6 percent
Mittenbutte: 6 percent
Areas with 10-15 percent slope: 2 percent

Use and Management

This unit is used as rangeland and wildlife habitat.

This unit is poorly suited for stockwater ponds. The main limitations are the depth to bedrock within the

Xema soil and the high potential of both soils for seepage losses.

This unit is moderately well suited for mechanical range renovation and range seeding. The main limitation for range seeding is the hazard of wind erosion. Mechanical range renovation may not be economically feasible due to the coarse texture of the surface layer. To reduce the hazard of wind erosion, adequate residue must be maintained on the surface at all times until the seeding is established. Tilled areas must remain narrow and at right angles to the wind. The low annual precipitation should be considered when planning a seeding.

For general and detailed information about managing this map unit, see the following sections in Part II of this publication: Agronomy, Range, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

239—Ironbutte-Fairburn-Mittenbutte complex, 6 to 40 percent slopes

Setting

Elevation: 4,300 to 4,800 feet
Mean annual precipitation: 15 to 17 inches
Frost-free period: 105 to 130 days

Major Component Description

Ironbutte and similar soils

Composition: 30 percent
Landform: Hill, ridge
Landform Element: Summit, shoulder
Slope: 6 to 40 percent
Depth to Restrictive Feature: Strongly contrasting textural stratification: 10 to 20 inches
Drainage Class: Well drained
Parent Material: Alluvium and/or colluvium derived from porcelanite
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 4 inches; channery loam
C—4 to 12 inches; very channery loam
2C—12 to 60 inches; fragmental material
Note: Permeability of the Ironbutte soil is moderate in the upper part and very rapid in the underlying material. Available water capacity is very low. Effective rooting depth is variable due to the fractured nature of porcelanite. Runoff is medium. The hazard of water erosion is severe. The hazard of wind erosion is slight.

Fairburn and similar soils

Composition: 25 percent
Landform: Hill, ridge
Landform Element: Summit, shoulder
Slope: 6 to 40 percent
Depth to Restrictive Feature: Bedrock (paralithic): 10 to 20 inches
Drainage Class: Well drained
Parent Material: Residuum weathered from sandstone and shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 4 inches; loam
C—4 to 15 inches; loam
Cr—15 to 60 inches; bedrock
Note: Permeability of the Fairburn soil is moderate. Available water capacity is very low. Effective rooting depth is 10 to 20 inches. Runoff is very high. The hazard of water erosion is severe. The hazard of wind erosion is moderate.

Mittenbutte and similar soils

Composition: 25 percent
Landform: Hill, ridge
Landform Element: Summit, shoulder
Slope: 6 to 40 percent
Depth to Restrictive Feature: Bedrock (paralithic): 10 to 20 inches
Drainage Class: Well drained
Parent Material: Residuum weathered from calcareous sandstone
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 3 inches; fine sandy loam
C—3 to 16 inches; fine sandy loam
Cr—16 to 60 inches; bedrock
Note: Permeability of the Mittenbutte soil is moderately rapid. Available water capacity is very low. Effective rooting depth is 10 to 20 inches. Runoff is very high. The hazard of water and wind erosion is severe.

Typical soil descriptions with range in characteristics are included, in alphabetical order, in the section Soil Series and Their Morphology.

Additional Components

Badland: 5 percent
Pitchdraw: 5 percent
Samsil: 5 percent
Ucross: 5 percent

Use and Management

This unit is used as rangeland and wildlife habitat.

This unit is poorly suited for stockwater ponds, mechanical range renovation, and range seeding. The main limitations are slope and the depth to bedrock.

For general and detailed information about managing this map unit, see the following sections in Part II of this publication: Agronomy, Range, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

240—Wibaux-Wibaux, thin solum complex, 6 to 40 percent slopes

Setting

Elevation: 4,200 to 5,200 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 105 to 130 days

Major Component Description

Wibaux and similar soils

Composition: 60 percent
Landform: Hill, ridge
Landform Element: Summit, shoulder
Slope: 6 to 40 percent
Depth to Restrictive Feature: Strongly contrasting textural stratification: 6 to 10 inches
Drainage Class: Well drained
Parent Material: Alluvium and/or colluvium over residuum weathered from porcelanite
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 3 inches; channery fine sandy loam
C—3 to 16 inches; very channery loam
2C—16 to 60 inches; fragmental material
Note: Permeability of the Wibaux soil is moderately rapid in the upper part and very rapid in the underlying material. Available water capacity is very low. Effective rooting depth is variable due to the fractured nature of porcelanite. Runoff is medium. The hazard of water erosion is severe. The hazard of wind erosion is moderate.

Wibaux and similar soils

Composition: 20 percent
Landform: Hill, ridge
Landform Element: Summit, shoulder
Slope: 6 to 40 percent
Depth to Restrictive Feature: Strongly contrasting textural stratification: 6 to 10 inches
Drainage Class: Well drained
Parent Material: Alluvium and/or colluvium over residuum weathered from porcelanite
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 3 inches; very channery loam
C—3 to 9 inches; extremely channery loam
2C—9 to 60 inches; fragmental material
Note: Permeability of the Wibaux, thin solum soil is moderately rapid in the upper part and very rapid in the underlying material. Available water capacity is very low. Effective rooting depth is variable due to the fractured nature of porcelanite. Runoff is medium. The hazard of water erosion is moderate. The hazard of wind erosion is slight.

Typical soil descriptions with range in characteristics are included, in alphabetical order, in the section Soil Series and Their Morphology.

Additional Components

Badland: 4 percent
Teckla: 4 percent
Wibaux very channery loam: 4 percent
Wibaux, thin solum very channery fine sandy loam: 4 percent
Areas with 3-6 percent slope: 2 percent
Areas with 40-60 percent slope: 2 percent

Use and Management

This unit is used as rangeland and wildlife habitat. Occasional coniferous trees occur in some areas of the Rochelle Hills.

This unit is poorly suited for stockwater ponds, mechanical range renovation, and range seeding. The main limitation is steepness of slope.

For general and detailed information about managing this map unit, see the following sections in Part II of this publication: Agronomy, Range, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

241—Ironbutte-Ironbutte, thin solum channery loams, 6 to 40 percent slopes

Setting

Elevation: 4,100 to 4,800 feet
Mean annual precipitation: 15 to 17 inches
Frost-free period: 105 to 130 days

Major Component Description

Ironbutte and similar soils

Composition: 55 percent
Landform: Hill, ridge
Landform Element: Summit, shoulder
Slope: 6 to 40 percent
Depth to Restrictive Feature: Strongly contrasting textural stratification: 10 to 20 inches
Drainage Class: Well drained
Parent Material: Alluvium and/or colluvium derived from porcelanite
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 4 inches; channery loam
C—4 to 12 inches; very channery loam
2C—12 to 60 inches; fragmental material
Note: Permeability of the Ironbutte soil is moderate in the upper part and very rapid in the underlying material. Available water capacity is very low. Effective rooting depth is variable due to the fractured nature of porcelanite. Runoff is medium. The hazard of water erosion is severe. The hazard of wind erosion is slight.

Ironbutte and similar soils

Composition: 30 percent
Landform: Hill, ridge
Landform Element: Summit, shoulder
Slope: 6 to 40 percent
Depth to Restrictive Feature: Strongly contrasting textural stratification: 6 to 10 inches
Drainage Class: Well drained
Parent Material: Eolian deposits over residuum weathered from scoria
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 2 inches; channery loam
C—2 to 10 inches; very channery loam
2C—10 to 60 inches; fragmental material
Note: Permeability of the Ironbutte, thin solum soil is moderate in the upper part and very rapid in the underlying material. Available water capacity is very low. Effective rooting depth is variable due to the fractured nature of porcelanite. Runoff is medium. The hazard of water erosion is severe. The hazard of wind erosion is slight.

Typical soil descriptions with range in characteristics are included, in alphabetical order, in the section Soil Series and Their Morphology.

Additional Components

Areas with 3-6 percent slope: 4 percent
Muleherder: 4 percent
Rockybutte: 4 percent
Badland: 3 percent

Use and Management

This unit is used as rangeland and wildlife habitat. Occasional coniferous trees occur in some areas of the Rochelle Hills.

This unit is poorly suited for stockwater ponds, mechanical range renovation, and range seeding. The main limitation is steepness of slope.

For general and detailed information about managing this map unit, see the following sections in Part II of this publication: Agronomy, Range, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

242—Ironbutte-Deekay-Moorhead association, 3 to 30 percent slopes

Setting

Elevation: 4,300 to 4,800 feet
Mean annual precipitation: 15 to 17 inches
Frost-free period: 105 to 130 days

Major Component Description

Ironbutte and similar soils

Composition: 45 percent
Landform: Hill, ridge
Landform Element: Summit, shoulder
Slope: 6 to 30 percent
Depth to Restrictive Feature: Strongly contrasting textural stratification: 10 to 20 inches
Drainage Class: Well drained
Parent Material: Alluvium and/or colluvium derived from porcelanite
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 4 inches; channery loam
C—4 to 12 inches; very channery loam
2C—12 to 60 inches; fragmental material
Note: Permeability of the Ironbutte soil is moderate in the upper part and very rapid in the underlying material. Available water capacity is very low. Effective rooting depth is variable due to the fractured nature of porcelanite. Runoff is low. The hazard of water erosion is severe. The hazard of wind erosion is slight.

Deekay and similar soils

Composition: 20 percent
Landform: Fan remnant, hill
Landform Element: Backslope, footslope
Slope: 3 to 15 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Parent Material: Alluvium derived from sandstone and shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 4 inches; loam
Bt—4 to 23 inches; clay loam
Bk—23 to 60 inches; loam
Note: Permeability of the Deekay soil is moderate. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is low. The hazard of water erosion is severe. The hazard of wind erosion is moderate.

Moorhead and similar soils

Composition: 15 percent
Landform: Fan remnant, hill
Landform Element: Backslope, footslope
Slope: 3 to 15 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Parent Material: Alluvium derived from calcareous shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 4 inches; loam
Bt—4 to 26 inches; clay
Bk—26 to 60 inches; clay loam
Note: Permeability of the Moorhead soil is slow. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is high. The hazard of water erosion is severe. The hazard of wind erosion is moderate.

Typical soil descriptions with range in characteristics are included, in alphabetical order, in the section Soil Series and Their Morphology.

Additional Components

Iwait: 4 percent
Jaywest: 4 percent
Rockybutte: 4 percent
Fairburn: 3 percent
Ucross: 3 percent
Areas with 30-60 percent slope: 2 percent

Use and Management

This unit is used as rangeland and wildlife habitat.

The Wibaux soil is poorly suited for stockwater ponds, mechanical range renovation, and range seeding. The main limitation is steepness of slope. The Deekay and Moorhead soils are moderately well suited for stockwater ponds. The main limitations are the moderate potential for seepage losses and slope.

The Wibaux soil is poorly suited for mechanical range renovation and range seeding. The main limitations are the amount of rock fragments in the surface layer and the steepness of slope. The Deekay and Moorhead soils are moderately well suited for mechanical range renovation and range seeding. The main limitation is the hazard of water erosion. To reduce the hazard of erosion, adequate residue must be maintained on the surface at all times until the

seeding is established. Renovation and tillage for seeding should be along the contour of the slope. The low annual precipitation should be considered when planning a seeding.

For general and detailed information about managing this map unit, see the following sections in Part II of this publication: Agronomy, Range, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

243—Wibaux, thick solum-Wibaux channery fine sandy loams, 3 to 40 percent slopes

Setting

Elevation: 4,100 to 5,200 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 105 to 130 days

Major Component Description

Wibaux and similar soils

Composition: 45 percent
Landform: Hill, ridge
Landform Element: Backslope, footslope
Slope: 3 to 30 percent
Depth to Restrictive Feature: Strongly contrasting textural stratification: 20 to 40 inches
Drainage Class: Somewhat excessively drained
Parent Material: Alluvium and/or colluvium over residuum weathered from porcelanite
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 5 inches; channery fine sandy loam
Bk—5 to 23 inches; very channery fine sandy loam
2C—23 to 60 inches; fragmental material
Note: Permeability of the Wibaux, thick solum soil is moderately rapid in the upper part of the subsoil and very rapid in the underlying material. Available water capacity is very low. Effective rooting depth is variable due to the fractured nature of porcelanite. Runoff is low. The hazard of water erosion is severe. The hazard of wind erosion is moderate.

Wibaux and similar soils

Composition: 35 percent
Landform: Hill, ridge
Landform Element: Summit, shoulder
Slope: 3 to 40 percent
Depth to Restrictive Feature: Strongly contrasting textural stratification: 10 to 20 inches
Drainage Class: Well drained
Parent Material: Alluvium and/or colluvium over residuum weathered from porcelanite
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 3 inches; channery fine sandy loam
C—3 to 16 inches; extremely channery sandy clay loam
2C—16 to 60 inches; fragmental material
Note: Permeability of the Wibaux soil is moderately rapid in the upper part and very rapid in the underlying material. Available water capacity is very low. Effective rooting depth is variable due to the fractured nature of porcelanite. Runoff is medium. The hazard of water erosion is severe. The hazard of wind erosion is moderate.

Typical soil descriptions with range in characteristics are included, in alphabetical order, in the section Soil Series and Their Morphology.

Additional Components

Badland: 5 percent
Lawver: 5 percent
Teckla: 5 percent
Wibaux, thin solum: 5 percent

Use and Management

This unit is used as rangeland and wildlife habitat.

This unit is poorly suited for stockwater ponds, mechanical range renovation, and range seeding. The main limitation is steepness of slope.

For general and detailed information about managing this map unit, see the following sections in Part II of this publication: Agronomy, Range, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

244—Muleherder-Ironbutte channery loams, 3 to 40 percent slopes

Setting

Elevation: 4,100 to 4,800 feet
Mean annual precipitation: 15 to 17 inches
Frost-free period: 105 to 130 days

Major Component Description

Muleherder and similar soils

Composition: 45 percent
Landform: Hill, ridge
Landform Element: Backslope, footslope
Slope: 3 to 30 percent
Depth to Restrictive Feature: Strongly contrasting textural stratification: 20 to 40 inches
Drainage Class: Well drained
Parent Material: Alluvium and/or colluvium derived from porcelanite
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 2 inches; channery loam
Bw—2 to 16 inches; channery loam
BCk—16 to 33 inches; extremely channery fine sandy loam
2C—33 to 60 inches; fragmental material
Note: Permeability of the Muleherder soil is moderate in the upper part of the subsoil and very rapid in the underlying material. Available water capacity is very low. Effective rooting depth is variable due to the fractured nature of porcelanite. Runoff is low. The hazard of water erosion is severe. The hazard of wind erosion is slight.

Ironbutte and similar soils

Composition: 40 percent
Landform: Hill, ridge
Landform Element: Summit, shoulder
Slope: 6 to 40 percent
Depth to Restrictive Feature: Strongly contrasting textural stratification: 10 to 20 inches
Drainage Class: Well drained
Parent Material: Alluvium and/or colluvium derived from porcelanite
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 4 inches; channery loam
C—4 to 12 inches; very channery loam
2C—12 to 60 inches; fragmental material
Note: Permeability of the Ironbutte soil is moderate in the upper part and very rapid in the underlying material. Available water capacity is very low. Effective rooting depth is variable due to the fractured nature of porcelanite. Runoff is medium. The hazard of water erosion is severe. The hazard of wind erosion is slight.

Typical soil descriptions with range in characteristics are included, in alphabetical order, in the section Soil Series and Their Morphology.

Additional Components

Brislawn: 4 percent
Ironbutte, thin solum: 4 percent
Rockybutte: 4 percent
Badland: 3 percent

Use and Management

This unit is used as rangeland and wildlife habitat. Occasional coniferous trees occur in some areas of the Rochelle Hills.

This unit is poorly suited for stockwater ponds, mechanical range renovation, and range seeding. The main limitation is steepness of slope.

For general and detailed information about managing this map unit, see the following sections in Part II of this publication: Agronomy, Range, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

245—Wibaux-Shingle-Badland complex, 6 to 60 percent slopes

Setting

Elevation: 4,100 to 5,200 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 105 to 130 days

Major Component Description

Wibaux and similar soils

Composition: 35 percent
Landform: Hill, ridge
Landform Element: Summit, shoulder
Slope: 6 to 60 percent
Depth to Restrictive Feature: Strongly contrasting textural stratification: 10 to 20 inches
Drainage Class: Well drained
Parent Material: Alluvium and/or colluvium over residuum weathered from porcelanite
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None

Typical profile:
A—0 to 4 inches; channery loam
C—4 to 12 inches; very channery loam
2C—12 to 60 inches; fragmental material
Note: Permeability of the Wibaux soil is moderate in the upper part and very rapid in the underlying material. Available water capacity is very low. Effective rooting depth is variable due to the fractured nature of porcelanite. Runoff is low. The hazard of water erosion is severe. The hazard of wind erosion is slight.

Shingle and similar soils

Composition: 30 percent
Landform: Hill, ridge
Landform Element: Summit, shoulder
Slope: 6 to 60 percent
Depth to Restrictive Feature: Bedrock (paralithic): 10 to 20 inches
Drainage Class: Well drained
Parent Material: Residuum weathered from sandstone and shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 1 inches; loam
C—1 to 12 inches; loam
Cr—12 to 60 inches; bedrock
Note: Permeability of the Shingle soil is moderate. Available water capacity is very low. Effective rooting depth is 10 to 20 inches. Runoff is very high. The hazard of water erosion is severe. The hazard of wind erosion is moderate.

Badland

Composition: 15 percent
Landform: Hill, ridge
Landform Element: Summit, shoulder
Slope: —-
Depth to Restrictive Feature: Bedrock (paralithic): 0 to 0 inches
Drainage Class: —-
Parent Material: Residuum weathered from sandstone and shale
Flooding: —-
Water Table: No water table exists above a depth of 6 feet
Ponding: No seasonal ponding exists
Note: Badland consists of exposures of shale, sandstone, and porcelanite.

Typical soil descriptions with range in characteristics are included, in alphabetical order, in the section Soil Series and Their Morphology.

Additional Components

Renohill: 5 percent
Samday: 5 percent
Taluce: 5 percent
Theedle: 5 percent

Use and Management

This unit is used as rangeland and wildlife habitat.

This unit is poorly suited for stockwater ponds, mechanical range renovation, and range seeding. The main limitation is steepness of slope.

For general and detailed information about managing this map unit, see the following sections in Part II of this publication: Agronomy, Range, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

246—Wyarno-Ulm clay loams, 0 to 6 percent slopes

Setting

Elevation: 4,100 to 5,200 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 105 to 130 days

Major Component Description

Wyarno and similar soils

Composition: 50 percent
Landform: Alluvial fan, fan remnant
Landform Element: None assigned
Slope: 0 to 6 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Parent Material: Alluvium derived from calcareous shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 3 inches; clay loam
Bt—3 to 12 inches; clay
Bk—12 to 60 inches; clay loam
Note: Permeability of the Wyarno soil is slow. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is

medium. The hazard of water erosion is slight. The hazard of wind erosion is moderate.

Ulm and similar soils

Composition: 30 percent
Landform: Alluvial fan, fan remnant
Landform Element: None assigned
Slope: 0 to 6 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Parent Material: Alluvium derived from calcareous shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 4 inches; clay loam
Bt—4 to 25 inches; clay
Bk—25 to 60 inches; clay loam
Note: Permeability of the Ulm soil is slow. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is medium. The hazard of water and wind erosion is moderate.

Typical soil descriptions with range in characteristics are included, in alphabetical order, in the section Soil Series and Their Morphology.

Additional Components

Renohill: 8 percent
Forkwood: 7 percent
Heldt: 5 percent

Use and Management

This unit is used primarily as rangeland and wildlife habitat.

This unit is well suited for stockwater ponds, mechanical range renovation, and range seeding. Adequate residue must be maintained on the surface at all times until the seeding is established. The low annual precipitation should be considered when planning a seeding.

For general and detailed information about managing this map unit, see the following sections in Part II of this publication: Agronomy, Range, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

247—Wyotite-Ulm loams, 0 to 6 percent slopes

Setting

Elevation: 4,100 to 5,200 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 105 to 130 days

Major Component Description

Wyotite and similar soils

Composition: 50 percent
Landform: Alluvial fan, fan remnant
Landform Element: None assigned
Slope: 0 to 6 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Parent Material: Alluvium and/or eolian deposits derived from sandstone and shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 2 inches; loam
Bt—2 to 38 inches; silty clay loam
Bk—38 to 60 inches; silt loam
Note: Permeability of the Wyotite soil is moderate. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is very low. The hazard of water and wind erosion is moderate.

Ulm and similar soils

Composition: 30 percent
Landform: Alluvial fan, fan remnant
Landform Element: None assigned
Slope: 0 to 6 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Parent Material: Alluvium derived from calcareous shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 6 inches; loam
Bt—6 to 23 inches; silty clay
Bk—23 to 60 inches; silty clay loam

Note: Permeability of the Ulm soil is slow. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is medium. The hazard of water and wind erosion is moderate.

Additional Components

Cambria: 7 percent
Forkwood: 7 percent
Recluse: 6 percent

Use and Management

This unit is used primarily as rangeland and wildlife habitat.

The Wyotite soil is moderately well suited for stockwater ponds. The main limitation is the moderate potential for seepage losses. The Ulm soil is well suited for stockwater ponds.

This unit is well suited for mechanical range renovation and range seeding. Adequate residue must be maintained on the surface at all times until the seeding is established. The low annual precipitation should be considered when planning a seeding.

For general and detailed information about managing this map unit, see the following sections in Part II of this publication: Agronomy, Range, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

248—Ziggy-Iwait loams, 0 to 6 percent slopes

Setting

Elevation: 4,300 to 4,800 feet
Mean annual precipitation: 15 to 17 inches
Frost-free period: 105 to 130 days

Major Component Description

Ziggy and similar soils

Composition: 50 percent
Landform: Alluvial fan, fan remnant
Landform Element: None assigned
Slope: 0 to 6 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Parent Material: Alluvium derived from sandstone and shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 5 inches; loam
Bw—5 to 14 inches; loam
Bk—14 to 60 inches; clay loam
Note: Permeability of the Ziggy soil is moderate. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is low. The hazard of water erosion is slight. The hazard of wind erosion is moderate.

Iwait and similar soils

Composition: 30 percent
Landform: Alluvial fan, fan remnant
Landform Element: None assigned
Slope: 0 to 6 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Parent Material: Alluvium derived from sandstone and shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 6 inches; loam
Bk—6 to 60 inches; clay loam
Note: Permeability of the Iwait soil is moderate. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is low. The hazard of water erosion is slight. The hazard of wind erosion is moderate.

Typical soil descriptions with range in characteristics are included, in alphabetical order, in the section Soil Series and Their Morphology.

Additional Components

Deekay: 5 percent
Moorhead: 5 percent
Oldwolf: 5 percent
Recluse: 5 percent

Use and Management

This unit is used as rangeland, nonirrigated hayland and pasture, and wildlife habitat. A few areas are also used for homesite and urban development.

This unit is moderately well suited for stockwater ponds. The main limitation is the moderate seepage potential.

This unit is well suited for mechanical range renovation and range seeding. Adequate residue must be maintained on the surface at all times until the seeding is established. The low annual precipitation should be of concern when reseeding.

This unit is moderately well suited for nonirrigated hayland and pasture. The main limitation is low annual precipitation. Rotation grazing maintains optimum vigor and quality of forage.

This unit is well suited to homesite and urban development. It has few limitations.

For general and detailed information about managing this map unit, see the following sections in Part II of this publication: Agronomy, Range, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

249—Ziggy-Iwait loams, 6 to 15 percent slopes

Setting

Elevation: 4,300 to 4,800 feet
Mean annual precipitation: 15 to 17 inches
Frost-free period: 105 to 130 days

Major Component Description

Ziggy and similar soils

Composition: 50 percent
Landform: Hill, ridge
Landform Element: Backslope, footslope
Slope: 6 to 15 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Parent Material: Alluvium derived from sandstone and shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 5 inches; loam
Bw—5 to 14 inches; loam
Bk—14 to 60 inches; clay loam
Note: Permeability of the Ziggy soil is moderate. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is low. The hazard of water and wind erosion is moderate.

Iwait and similar soils

Composition: 30 percent
Landform: Hill, ridge
Landform Element: Backslope, footslope
Slope: 6 to 15 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Parent Material: Alluvium derived from sandstone and shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 6 inches; loam
Bk—6 to 60 inches; clay loam
Note: Permeability of the Iwait soil is moderate. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is low. The hazard of water and wind erosion is moderate.

Typical soil descriptions with range in characteristics are included, in alphabetical order, in the section Soil Series and Their Morphology.

Additional Components

Deekay: 5 percent
Oldwolf: 5 percent
Pitchdraw: 5 percent
Ucross: 5 percent

Use and Management

This unit is used as rangeland and wildlife habitat.

This unit is moderately well suited for stockwater ponds. The main limitations are the moderate seepage potential and slope.

This unit is well suited for mechanical range renovation and moderately well suited for range seeding. The main limitation is the hazard of erosion. To reduce the hazard of erosion, adequate residue must be maintained on the surface at all times until the seeding is established. If practical, renovation and

tillage should be along the contour of the slope. The low annual precipitation should be of concern when reseeding.

For general and detailed information about managing this map unit, see the following sections in Part II of this publication: Agronomy, Range, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

250—Ziggy-Ucross-Oldwolf loams, 3 to 15 percent slopes

Setting

Elevation: 4,300 to 4,800 feet
Mean annual precipitation: 15 to 17 inches
Frost-free period: 105 to 130 days

Major Component Description

Ziggy and similar soils

Composition: 35 percent
Landform: Fan remnant, hill
Landform Element: Backslope, footslope
Slope: 0 to 6 percent
Depth to Restrictive Feature: None noted
Drainage Class: Well drained
Parent Material: Alluvium derived from sandstone and shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 5 inches; loam
Bw—5 to 14 inches; loam
Bk—14 to 60 inches; clay loam
Note: Permeability of the Ziggy soil is moderate. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is low. The hazard of water and wind erosion is moderate.

Ucross and similar soils

Composition: 30 percent
Landform: Hill, ridge
Landform Element: Summit, shoulder
Slope: 3 to 15 percent
Depth to Restrictive Feature: Bedrock (paralithic): 20 to 40 inches
Drainage Class: Well drained
Parent Material: Alluvium over residuum weathered from sandstone and shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 5 inches; loam
Bk—5 to 31 inches; clay loam
Cr—31 to 60 inches; bedrock
Note: Permeability of the Ucross soil is moderate. Available water capacity is moderate. Effective rooting depth is 20 to 40 inches. Runoff is high. The hazard of water erosion is severe. The hazard of wind erosion is moderate.

Oldwolf and similar soils

Composition: 20 percent
Landform: Hill, ridge
Landform Element: Backslope, summit
Slope: 3 to 15 percent
Depth to Restrictive Feature: Bedrock (paralithic): 20 to 40 inches
Drainage Class: Well drained
Parent Material: Alluvium over residuum weathered from sandstone and shale
Flooding: None
Water Table: No water table exists above a depth of 6 feet
Ponding: None
Typical profile:
A—0 to 3 inches; loam
Bt—3 to 21 inches; clay loam
Bk—21 to 32 inches; loam
Cr—32 to 60 inches; bedrock
Note: Permeability of the Oldwolf soil is moderate. Available water capacity is moderate. Effective rooting depth is 20 to 40 inches. Runoff is medium. The hazard of water erosion is severe. The hazard of wind erosion is moderate.

Typical soil descriptions with range in characteristics are included, in alphabetical order, in the section Soil Series and Their Morphology.

Additional Components

Cromack: 4 percent
Deekay: 4 percent
Fairburn: 4 percent
Areas with 0-3 percent slope: 3 percent

Use and Management

This unit is used primarily as rangeland and wildlife habitat.

The Ziggy soil is moderately well suited for stockwater ponds. The main limitation is the moderate seepage potential. The Ucross and Oldwolf soils are poorly suited for stockwater ponds. The main limitation is depth to bedrock.

This unit is well suited for mechanical range renovation and moderately well suited for range seeding. The main limitation for range seeding is the hazard of water erosion. To reduce the hazard of erosion, adequate residue must be maintained on the surface at all times until the seeding is established. If practical, renovation and tillage should be done along the contour of the slope. The low annual precipitation should be of concern when reseeding.

For general and detailed information about managing this map unit, see the following sections in Part II of this publication: Agronomy, Range, Recreation, Wildlife Habitat, Engineering, and Soil Properties.

Acreage and Proportionate Extent of the Soils

Map symbol	Soil name	Acres	Percent
100	Aridic Ustorthents, saline, 0 to 4 percent slopes	1,548	*
101	Arvada, thick surface very fine sandy loam, 0 to 6 percent slopes	3,890	0.2
102	Arvada, thick surface-Arvada-Slickspots complex, 0 to 6 percent slopes	36,028	2.0
103	Arwite fine sandy loam, 0 to 6 percent slopes	11,006	0.6
104	Arwite fine sandy loam, 6 to 15 percent slopes	2,257	0.1
105	Arwite-Elwop fine sandy loams, 0 to 6 percent slopes	6,623	0.4
106	Arwite-Elwop fine sandy loams, 6 to 15 percent slopes	7,885	0.4
107	Arwite-Vonalf fine sandy loams, 0 to 6 percent slopes	6,961	0.4
108	Arwite-Vonalf fine sandy loams, 6 to 15 percent slopes	2,684	0.1
109	Bidman loam, 0 to 6 percent slopes	9,374	0.5
110	Bidman loam, loamy substratum, 0 to 6 percent slopes	3,961	0.2
111	Bidman-Parmleed loams, 0 to 6 percent slopes	36,035	2.0
112	Bidman-Parmleed loams, 6 to 15 percent slopes	8,726	0.5
113	Bidman-Ulm loams, 0 to 6 percent slopes	26,627	1.5
114	Bowbac-Taluce-Badland complex, 3 to 20 percent slopes	1,074	*
115	Bowbac-Worf fine sandy loams, 3 to 15 percent slopes	2,420	0.1
116	Cambria-Kishona-Zigweid loams, 0 to 6 percent slopes	28,172	1.6
117	Cambria-Kishona-Zigweid loams, 6 to 15 percent slopes	11,599	0.6
118	Clarkelen-Draknab complex, 0 to 3 percent slopes	2,429	0.1
119	Clarkelen-Embry fine sandy loams, 0 to 4 percent slopes	5,139	0.3
120	Clarkelen-Keeline association, 0 to 6 percent slopes	2,316	0.1
121	Cushman-Cambria loams, 0 to 6 percent slopes	17,480	1.0
122	Cushman-Cambria loams, 6 to 15 percent slopes	21,127	1.2
123	Cushman-Renohill loams, 6 to 15 percent slopes	3,321	0.2
124	Cushman-Shingle loams, 6 to 15 percent slopes	9,295	0.5
125	Cushman-Terro complex, 6 to 15 percent slopes	311	*
126	Cushman-Theedle loams, 0 to 6 percent slopes	8,590	0.5
127	Cushman-Theedle loams, 6 to 15 percent slopes	12,765	0.7
128	Cushman-Worf loams, 3 to 15 percent slopes	10,501	0.6
129	Decolney-Hiland fine sandy loams, 0 to 6 percent slopes	16,891	0.9
130	Decolney-Hiland fine sandy loams, 6 to 15 percent slopes	2,923	0.2
131	Deekay loam, 0 to 6 percent slopes	5,801	0.3
132	Deekay-Moorhead loams, 0 to 6 percent slopes	11,431	0.6
133	Deekay-Moorhead loams, 6 to 15 percent slopes	2,251	0.1
134	Deekay-Oldwolf loams, 0 to 6 percent slopes	16,292	0.9
135	Deekay-Oldwolf loams, 6 to 15 percent slopes	14,117	0.8
136	Deekay-Ziggy loams, 0 to 6 percent slopes	5,027	0.3
137	Echeta clay loam, 0 to 6 percent slopes	2,075	0.1
138	Echeta-Cromack clay loams, 6 to 15 percent slopes	2,710	0.2
139	Embry-Orpha complex, 3 to 15 percent slopes	6,322	0.4
140	Embry-Taluce sandy loams, 3 to 20 percent slopes	3,100	0.2
141	Emigha loam, 0 to 3 percent slopes	2,538	0.1
142	Emigha, sodic-Arvada, thick surface complex, 0 to 4 percent slopes	4,190	0.2
143	Felix clay, ponded, 0 to 2 percent slopes	4,999	0.3
144	Forkwood loam, 0 to 6 percent slopes	17,180	1.0
145	Forkwood-Cambria loams, 0 to 6 percent slopes	27,808	1.6
146	Forkwood-Cushman loams, 0 to 6 percent slopes	93,833	5.2
147	Forkwood-Cushman loams, 6 to 15 percent slopes	52,821	2.9
148	Forkwood-Ulm loams, 0 to 6 percent slopes	42,956	2.4
149	Forkwood-Ulm loams, 6 to 15 percent slopes	5,313	0.3
150	Gateson-Taluce-Turnercrest complex, 6 to 30 percent slopes	11,461	0.6
151	Haverdad loam, 0 to 3 percent slopes	9,753	0.5
152	Haverdad-Clarkelen complex, 0 to 4 percent slopes	2,082	0.1
153	Haverdad-Kishona association, 0 to 6 percent slopes	11,770	0.7
154	Heldt clay loam, 0 to 6 percent slopes	4,048	0.2
155	Heldt-Bidman complex, saline, 0 to 3 percent slopes	3,411	0.2
156	Hiland fine sandy loam, 0 to 6 percent slopes	5,334	0.3
157	Hiland-Bowbac fine sandy loams, 0 to 6 percent slopes	60,415	3.4
158	Hiland-Bowbac fine sandy loams, 6 to 15 percent slopes	53,710	3.0
159	Hiland-Vonalee fine sandy loams, 0 to 6 percent slopes	12,405	0.7
160	Hiland-Vonalee fine sandy loams, 6 to 15 percent slopes	5,527	0.3

* See footnote at end of table.

Acreage and Proportionate Extent of the Soils--Continued

Map symbol	Soil name	Acres	Percent
161	Hilight-Taluce, cool-Wags complex, 6 to 40 percent slopes	5,187	0.3
162	Lismas-Mittenbutte, cool-Sabatka complex, 6 to 40 percent slopes	2,965	0.2
163	Hilight-Wags-Badland complex, 3 to 45 percent slopes	80,864	4.5
164	Lismas-Sabatka-Badland complex, 3 to 45 percent slopes	6,967	0.4
165	Jayem fine sandy loam, 6 to 20 percent slopes	1,906	0.1
166	Jaywest loam, 0 to 6 percent slopes	4,668	0.3
167	Jaywest-Moorhead loams, 0 to 6 percent slopes	11,357	0.6
168	Jaywest-Spottedhorse loams, 0 to 6 percent slopes	8,484	0.5
169	Julesburg fine sandy loam, 0 to 6 percent slopes	1,225	*
170	Keeline-Tullock loamy sands, 6 to 30 percent slopes	13,678	0.8
171	Keeline-Tullock-Niobrara, dry complex, 3 to 30 percent slopes	10,236	0.6
172	Keyner fine sandy loam, 0 to 6 percent slopes	10,761	0.6
173	Lawver-Teckla-Wibaux complex, 0 to 6 percent slopes	6,217	0.3
174	Brislawn-Rockybutte-Ironbutte complex, 0 to 10 percent slopes	4,222	0.2
175	Lawver-Wibaux complex, 6 to 30 percent slopes	2,865	0.2
176	Leiter-Cromack clay loams, 3 to 15 percent slopes	1,839	0.1
177	Maysdorf fine sandy loam, 0 to 6 percent slopes	5,189	0.3
178	Maysdorf sandy clay loam, 0 to 6 percent slopes	701	*
179	Maysdorf-Pugsley sandy loams, 0 to 6 percent slopes	10,371	0.6
180	Maysdorf-Pugsley sandy loams, 6 to 15 percent slopes	6,226	0.3
181	Moorhead clay loam, 0 to 6 percent slopes	10,473	0.6
182	Moorhead loam, 0 to 6 percent slopes	2,209	0.1
183	Moorhead-Leiter clay loams, 0 to 6 percent slopes	8,315	0.5
184	Moorhead-Leiter clay loams, 6 to 15 percent slopes	8,574	0.5
185	Moskee fine sandy loam, 0 to 6 percent slopes	2,789	0.2
186	Moskee fine sandy loam, 6 to 10 percent slopes	124	*
187	Nuncho loam, 0 to 6 percent slopes	3,063	0.2
188	Orpha-Tullock loamy sands, 6 to 30 percent slopes	3,288	0.2
189	Oshoto-Moorhead loams, 0 to 6 percent slopes	2,109	0.1
190	Parmleed-Renohill complex, 3 to 15 percent slopes	5,154	0.3
191	Pits-Dumps complex	14,818	0.8
192	Platmak loam, 0 to 6 percent slopes	1,565	*
193	Pugsley-Decolney sandy loams, 0 to 6 percent slopes	1,304	*
194	Pugsley-Decolney sandy loams, 6 to 15 percent slopes	3,121	0.2
195	Rauzi fine sandy loam, 0 to 6 percent slopes	1,980	0.1
196	Rauzi sandy clay loam, 0 to 6 percent slopes	1,226	*
197	Rauzi-Elwop fine sandy loams, 2 to 10 percent slopes	3,041	0.2
198	Recluse loam, 0 to 6 percent slopes	1,458	*
199	Renohill-Savageton clay loams, 0 to 6 percent slopes	1,264	*
200	Renohill-Savageton clay loams, 6 to 15 percent slopes	2,747	0.2
201	Renohill-Shingle-Worf complex 3 to 15 percent slopes	4,458	0.2
202	Renohill-Worfka clay loams, 3 to 15 percent slopes	3,308	0.2
203	Rockypoint-Iwait association, 0 to 6 percent slopes	2,514	0.1
204	Samday-Samday, cool-Shingle clay loams, 6 to 40 percent slopes	7,685	0.4
205	Samday-Savageton clay loams, 3 to 15 percent slopes	7,108	0.4
206	Samday-Shingle-Badland complex, 10 to 45 percent slopes	16,975	0.9
207	Cromack-Fairburn-Ucross complex, 3 to 20 percent slopes	5,913	0.3
208	Savageton-Silhouette clay loams, 0 to 6 percent slopes	4,550	0.3
209	Savageton-Silhouette clay loams, 6 to 15 percent slopes	3,053	0.2
210	Shingle-Taluce complex, 3 to 30 percent slopes	11,667	0.7
211	Shingle-Worf loams, 3 to 30 percent slopes	10,117	0.6
212	Teckla very fine sandy loam, 0 to 10 percent slopes	2,445	0.1
213	Terro-Taluce sandy loams, 6 to 30 percent slopes	4,153	0.2
214	Theedle-Kishona loams, 0 to 6 percent slopes	37,258	2.1
215	Theedle-Kishona loams, 6 to 20 percent slopes	72,449	4.0
216	Theedle-Kishona-Shingle loams, 3 to 30 percent slopes	35,213	2.0
217	Theedle-Shingle loams, 3 to 30 percent slopes	105,717	5.9
218	Theedle-Turnercrest-Kishona complex, 3 to 15 percent slopes	10,481	0.6
219	Torriarents-Torriorthents complex, reclaimed	3,175	0.2
220	Pitchdraw-Ashollow-Niobrara complex, 3 to 30 percent slopes	8,099	0.5
221	Turnercrest-Keeline-Taluce fine sandy loams, 6 to 30 percent slopes	17,870	1.0
222	Turnercrest-Wibaux, thin solum-Taluce complex, 6 to 40 percent slopes	1,258	*

* See footnote at end of table.

Acreage and Proportionate Extent of the Soils--Continued

Map symbol	Soil name	Acres	Percent
223	Ucross loam, 1 to 9 percent slopes	2,562	0.1
224	Ucross-Iwait loams, 0 to 6 percent slopes	5,901	0.3
225	Ucross-Iwait-Fairburn loams, 3 to 30 percent slopes	25,650	1.4
226	Ulm loam, 0 to 6 percent slopes	8,024	0.4
227	Ulm clay loam, 0 to 6 percent slopes	18,642	1.0
228	Ulm-Renohill clay loams, 0 to 6 percent slopes	16,140	0.9
229	Ulm-Renohill clay loams, 6 to 15 percent slopes	3,707	0.2
230	Urban land-Deekay-Moorhead complex, 0 to 6 percent slopes	3,879	0.2
231	Urban land-Leiter-Moorhead complex, 3 to 10 percent slopes	779	*
232	Urban land-Pitchdraw-Ashollow complex, 6 to 15 percent slopes	604	*
233	Ustic Torriorthents, gullied	77,884	4.3
234	Ustic Torriorthents-Badland complex, 10 to 100 percent slopes	29,768	1.7
235	Vonalee fine sandy loam, 0 to 10 percent slopes	3,346	0.2
236	Vonalee-Terro fine sandy loams, 2 to 10 percent slopes	11,884	0.7
237	Vonalf fine sandy loam, 0 to 6 percent slopes	1,176	*
238	Vonalf-Xema fine sandy loams, 3 to 10 percent slopes	8,149	0.5
239	Ironbutte-Fairburn-Mittenbutte complex, 6 to 40 percent slopes	5,669	0.3
240	Wibaux-Wibaux, thin solum complex, 6 to 40 percent slopes	31,560	1.8
241	Ironbutte-Ironbutte, thin solum channery loams, 6 to 40 percent slopes	6,837	0.4
242	Ironbutte-Deekay-Moorhead association, 3 to 30 percent slopes	9,328	0.5
243	Wibaux, thick solum-Wibaux channery fine sandy loams, 3 to 40 percent slopes	8,935	0.5
244	Muleherder-Ironbutte channery loams, 3 to 40 percent slopes	5,491	0.3
245	Wibaux-Shingle-Badland complex, 6 to 60 percent slopes	8,136	0.5
246	Wyarno-Ulm clay loams, 0 to 6 percent slopes	1,268	*
247	Wyotite-Ulm loams, 0 to 6 percent slopes	2,226	0.1
248	Ziggy-Iwait loams, 0 to 6 percent slopes	6,924	0.4
249	Ziggy-Iwait loams, 6 to 15 percent slopes	2,207	0.1
250	Ziggy-Ucross-Oldwolf loams, 3 to 15 percent slopes	15,628	0.9
251	Water	285	*
	Total	1,793,243	100.0

* Less than 0.1 percent.

Formation and Classification of the Soils

The soils in the survey area are the product of complex interrelated processes. They are the result of living organisms and climate acting on parent material that has a particular relief over a period of time. The role of each of these factors in the formation of the soils is explained in the paragraphs that follow. This is followed by a discussion of the processes of soil horizon differentiation.

Factors of Soil Formation

Parent Material

Parent material is the unconsolidated material from which soils form. Soils inherit many of their physical and chemical properties from their parent material. Parent materials accumulate from the weathering of underlying bedrock, from transportation of sediments by wind, water, or gravity, or by a combination of these agents.

The soils in the survey area formed primarily in sediments derived from the Fort Union and Wasatch Formations. These formations, comprised of interbedded sandstone and shale bedrock, are usually weakly consolidated and therefore susceptible to weathering and erosion. The parent materials from which soils formed in the survey area include residuum, alluvium, wind-deposited sediments, or a combination of these materials.

Soils on structural, or bedrock controlled, surfaces formed primarily in residuum. These surfaces include ridges, hills, breaks, and conical peaks. Soils formed in residuum typically exhibit properties similar to that of the underlying bedrock, and they commonly show minimal development. Taluce soils are shallow soils formed in residuum derived from sandstone; Samday soils are shallow soils formed in residuum derived from shale. Some developed soils formed in residuum. They occur on more stable structural surfaces, including broad upland ridges and buttes. Cushman and Renohill are examples of these kinds of soils.

Alluvium is material that has been transported downslope by moving water. The characteristics of alluvium depend on the upsweep source rather than on the underlying geologic formation. If the source is mixed kinds of rock, the soils that form will exhibit differing kinds of qualities. For example, Bidman soils formed in alluvium derived primarily from shale, where Forkwood soils formed in alluvium derived from mixed sources, including sandstone and shale. Bidman soils have more clay in the subsoil and are less permeable than are Forkwood soils.

Alluvial deposits occur on a wide variety of landforms. The older landforms are typically on upland positions, including fan terraces, relict terraces, and lower hillslopes. These are relatively stable landscape positions on which strongly developed soils, such as Bidman and Parmleed, formed. Intermediate age landforms include the lower fan terraces, low terraces, and playas. The degree of soil development varies on these surfaces. Examples of soils which formed in alluvium on these landforms are the Cambria, Emigha, Felix, and Forkwood soils. Flood plains contain the youngest alluvial deposits in the survey area. Soils on flood plains, such as Clarkelen and Haverdad, exhibit little or no development.

Eolian deposits occur throughout the survey area. Eolian deposits are derived primarily from sandstone, but may come from other sandy sources such as recent alluvium. Sand that is not protected by vegetation is moved by the wind and deposited as dunes on the leeward side of rock outcroppings and streams. Soils formed in these deposits, such as Orpha and Tullock, exhibit minimal development. Some dunes on upland positions are relatively stable. Soils developed in these materials, such as Halide and Maysdorf, exhibit a distinct subsoil and have accumulations of fine clay particles overlying layers of calcium carbonate.

Climate

Precipitation and temperature directly influence soil formation and development by their effect on the weathering of parent material, runoff and erosion, and the types of vegetation that can grow in a geographic area.

Precipitation provides the water necessary for soil formation. It alters the parent material and landscape in many ways. Water dissolves many minerals and contributes to chemical reactions. Some minerals are removed, and others are altered or translocated within the soil profile. Water also provides the energy to loosen and transport sediment. Given enough time, water will level the landscape, which in turn reduces slope gradients and leads to stabilization of the landscape.

Temperature influences the rate of chemical and biological reactions. Low temperatures allow frost action to disintegrate rock. Freezing and thawing influence soil structure. The length and rate of biological activity in soil is directly related to the length of time the air and soil is above a certain temperature.

Relief

Relief is the relative change in elevation of a landform. It affect soil formation by determining the stability of a given landscape position. Substantial erosion of material removes the developing soils, whereas accumulation of material buries the developing soil. Generally, convex positions are more susceptible to erosion and concave positions are more susceptible to accumulation. Soils on steeper slopes are less stable than those on gentler slopes because they are more susceptible to erosion. Soils on ridges and steep hills generally exhibit less development than those on adjacent less sloping areas of hills and fan terraces. Conversely, soils that formed in depressions and in the lower lying areas of flood plains accumulate sediment faster than soil horizons can mature.

Other soil properties that are related to relief are soil temperature, soil moisture, and soil organic matter content. Soils on north- and east-facing slopes receive less direct sunlight than those on south- and west-facing slopes. As a result, these soils tend to be cooler and more moist. Some slopes also tend to accumulate snow. Plant cover is generally denser and more organic matter accumulates in the topsoil on the cooler slopes.

Jayem soils formed primarily as a result of relief. These soils occur on the leeward, or depositional sides of hills. They receive additional moisture from snowpack during the winter months which is available to plants in the spring. This additional moisture results inincreased vegetative production which, in turn, results in increased organic matter returned to the soil.

Plant and Animal Life

Plants and animals are significant contributors to soil formation and development. Plants convert mineral nutrients, light energy, and water into organic compounds that eventually enrich the soil. Animals use plants, and animal wastes and remains are incorporated into the soil. Plant roots and burrowing animals tend to disturb soil layers while enhancing the movement of water and air in soils.

Darkening of the original parent material by addition of organic matter is the first observable step in the formation of many soils. Some of the younger soils are distinguishable from their parent material solely by this addition. Grasses tend to encourage development of a darker-colored, thick topsoil than do trees, which tie up organic compounds.

Both macro- and microfauna disturb the soil by burrowing. Badgers, prairie dogs, and smaller rodents move large quantities of subsoil and underlying material toward the surface. Abandoned burrows are eventually filled with topsoil. Worms and insects make many small burrows that promote soil aeration and water movement. These small burrows are less destructive of the soil horizons than the burrows of the larger animals.

Gateson soils formed as a result of the combination of climate, relief, and plants. These soils formed under a canopy of ponderosa pine and juniper. These trees favor a cooler, more moist environment, similar to that found on the north-and east-facing slopes of the Rochelle Hills. In addition, the trees created their own environment or microclimate. They act as a windbreak, catching additional snowfall during the winter and spring, and provide shade, keeping soil temperatures cooler than normal for this area. These conditions favored the development of the Gateson soil.

Time

Climate, relief, and plants and animals alter the parent material over a period of time. Time allows these factors to interact, and the relative influence of each varies considerably. Long periods of drought or excessive precipitation gradually alter the plant cover and the animal species that occupy the various habitats. Long periods of intense rainfall affect soil development by stripping away soil material, exposing parent material, or by burying developed soils. High populations of grazing animals can deplete plant cover and expose soils to accelerated erosion.

The youngest soils in the survey area are those on flood plains and on the steep slopes of breaks, dunes, escarpments, and ridges. These soils exhibit only a small amount of organic matter accumulation and have little or no structural development. Haverdad, Orpha, Wags, and Wibaux soils are examples of young soils.

Soils of intermediate maturity have higher organic matter accumulations, have a subsoil that is distinguishable by color or structure, and are either leached of, or have distinct accumulations of calcium carbonate. Silhouette and Zigweid soils are examples. These soils are thought to have developed under climatic conditions similar to those of the present time.

The next oldest soils have a distinct subsoil in which accumulations of fine clay particles overlie accumulation of calcium carbonate. Forkwood, Hiland, and Ulm soils are examples.

The oldest soils exhibit strong evidence of translocation and accumulation of fine clay within a 1-inch vertical distance at the upper boundary of the argillic horizon. The older the soil, the more likely it is that it was subject to higher precipitation during glacial periods. Bidman and Parmleed soils are examples.

Other factors being the same, the greater the length of time the parent material has been in place, the more development has taken place in the soil. For example, the Kishona, Zigweid, and Forkwood soils all formed in medium-textured sediments on nearly level to gently sloping surfaces. The minimal development of the Kishona soils, the intermediate development of the Zigweid soils, and the much stronger development of the Forkwood soils is directly proportional to the age of the position they occupy.

Process of Horizon Formation

Individual soil horizons form as a result of the four basic processes of addition, removal, transfer, and transformation of substances in the soil. These processes act primarily on organic matter, soluble salts, carbonates, and silicate clay minerals.

Addition of organic matter to the surface layer and transformation of organic matter into humus are the most common processes involved in horizon development. The profile of most of the soils in this survey area has also been leached of salt by the downward movement of water. This leaching has also transferred calcium carbonate to varying depths in the soil. Accumulations of deeply leached carbonates are most prominent in the lower part of the subsoil. Unless sodium is present, carbonates must be leached in order for clay to be translocated from the surface layer to the subsoil. This is because sodium disperses clay particles and carbonates inhibit dispersion. Significant movement of fine clay by water into the subsoil creates an argillic horizon. Extensive removal of clay from the surface layer creates an alluvial horizon that is nearly devoid of clay and organic matter.

Some clayey soils in nearly level areas have accumulations of sodium and soluble salts because all the surface water cannot percolate through the soil profile. A natric horizon occurs in these soils. In occasional flooded or ponded soils, oxidation and reduction transforms iron and forms redoximorphic features.

Classification of the Soils

The system of soil classification used by the National Cooperative Soil Survey has six categories (USDA, 1998 and 1999). Beginning with the broadest, these categories are the order, suborder, great group, subgroup, family, and series. Classification is based on soil properties observed in the field or inferred from those observations or from laboratory measurements. The table, "Classification of the Soils," shows the classification of the soils in the survey area. The categories are defined in the following paragraphs.

ORDER. Twelve soil orders are recognized. The differences among orders reflect the dominant soil-forming processes and the degree of soil formation. Each order is identified by a word ending in *sol*. An example is Alfisol.

SUBORDER. Each order is divided into suborders primarily on the basis of properties that influence soil genesis and are important to plant growth or properties that reflect the most important variables within the orders. The last syllable in the name of a suborder indicates the order. An example is Orthent (*Orth*, meaning true or common, plus *ent*, from Entisol).

GREAT GROUP. Each suborder is divided into great groups on the basis of close similarities in kind, arrangement, and degree of development of pedogenic horizons; soil moisture and temperature regimes; type of saturation; and base status. Each great group is identified by the name of a suborder

and by a prefix that indicates a property of the soil. An example is Torriorthents (*Torri*, meaning hot and dry climate conditions, plus *orthents*, the suborder of the Entisols that are most common).

SUBGROUP. Each great group has a typic subgroup. Other subgroups are intergrades or extragrades. The typic subgroup is the central concept of the great group; it is not necessarily the most extensive. Intergrades are transitions to other orders, suborders, or great groups. Extragrades have some properties that are not representative of the great group but do not indicate transitions to any other taxonomic class. Each subgroup is identified by one or more adjectives preceding the name of the great group. The adjective *Ustic* identifies the subgroup that receives more precipitation than the one that typifies the great group. An example is Ustic Torriorthents.

FAMILY. Families are established within a subgroup on the basis of physical and chemical properties and other characteristics that affect management. Generally, the properties are those of horizons below plow depth where there is much biological activity. Among the properties and characteristics considered are particle size, mineral content, CEC activity class, soil temperature regime, soil depth, and reaction. A family name consists of the name of a subgroup preceded by terms that indicate soil properties. An example is fine-loamy, mixed, superactive, calcareous, mesic Ustic Torriorthents.

SERIES. The series consists of soils within a family that have horizons similar in color, texture, structure, reaction, consistence, mineral and chemical composition, and arrangement in the profile.

The Kishona series is an example of a fine-loamy, mixed, superactive, calcareous Mesic Ustic Torriorthents.

Classification of the Soils

(An asterisk in the first column indicates a taxadjunct to the series. See text for a description of those characteristics that are outside the range of the series.)

Soil name	Family or higher taxonomic class
Absted	Fine, smectitic, mesic Haplic Ustic Natrargids
Aridic Ustorthents	Aridic Ustorthents
Arvada	Fine, smectitic, mesic Vertic Natrargids
Arwite	Fine-loamy, mixed, superactive, mesic Aridic Haplustalfs
Ashollow	Coarse-loamy, mixed, superactive, calcareous, mesic Aridic Ustorthents
Bidman	Fine, smectitic, mesic Ustic Paleargids
Boruff	Fine, smectitic, calcareous, mesic Vertid Fluvaquents
Bowbac	Fine-loamy, mixed, superactive, mesic Ustic Haplargids
Brislawn	Fine, smectitic, mesic Aridic Paleustalfs
Cambria	Fine-loamy, mixed, superactive, mesic Ustic Haplargids
Clarkelen	Coarse-loamy, mixed, superactive, calcareous, mesic Ustic Torrifluvents
*Clarkelen	Coarse-loamy, mixed, superactive, nonacid, mesic Ustic Torrifluvents
Cromack	Fine, smectitic, mesic Aridic Haplustepts
Cushman	Fine-loamy, mixed, superactive, mesic Ustic Haplargids
Decolney	Fine-loamy, mixed, superactive, mesic Ustic Haplargids
Deekay	Fine-loamy, mixed, superactive, mesic Aridic Haplustalfs
Draknab	Sandy, mixed, mesic Ustic Torrifluvents
Echeta	Fine, smectitic, mesic Torrertic Haplustepts
Elwop	Fine-loamy, mixed, superactive, mesic Aridic Haplustalfs
Embry	Coarse-loamy, mixed, superactive, nonacid, mesic Ustic Torriorthents
Emigha	Fine-silty, mixed, superactive, mesic Ustifluventic Haplocambids
Fairburn	Loamy, mixed, superactive, calcareous, mesic, shallow Aridic Ustorthents
Felix	Very-fine, smectitic, mesic Aridic Epiaquerts
Forkwood	Fine-loamy, mixed, superactive, mesic Ustic Haplargids
Gateson	Fine-loamy, mixed, superactive, mesic Aridic Haplustalfs
Haverdad	Fine-loamy, mixed, superactive, calcareous, mesic Ustic Torrifluvents
Heldt	Fine, smectitic, mesic Ustertic Haplocambids
Hiland	Fine-loamy, mixed, superactive, mesic Ustic Calciargids
Hilight	Clayey, smectitic, nonacid, mesic, shallow Ustic Torriorthents
Ironbutte	Loamy-skeletal over fragmental, mixed, superactive, nonacid, mesic Aridic Ustorthents
Iwait	Fine-loamy, mixed, superactive, calcareous, mesic Aridic Ustorthents
Jayem	Coarse-loamy, mixed, superactive, mesic Aridic Haplustolls
Jaywest	Fine, smectitic, mesic Aridic Paleustalfs
Julesburg	Coarse-loamy, mixed, superactive, mesic Aridic Argiustolls
Keeline	Coarse-loamy, mixed, superactive, calcareous, mesic Ustic Torriorthents
Keyner	Fine-loamy, mixed, superactive, mesic Haplic Ustic Natrargids
Kishona	Fine-loamy, mixed, superactive, calcareous, mesic Ustic Torriorthents
Lawver	Fine, smectitic, mesic Ustic Paleargids
Leiter	Fine, smectitic, mesic Aridic Haplustalfs
Lismas	Clayey, smectitic, nonacid, mesic, shallow Aridic Ustorthents
Maysdorf	Fine-loamy, mixed, superactive, mesic Ustic Calciargids
Mittenbutte	Loamy, mixed, superactive, calcareous, mesic, shallow Aridic Ustorthents
*Mittenbutte	Loamy, mixed, superactive, nonacid, mesic, shallow Aridic Ustorthents
Moorhead	Fine, smectitic, mesic Aridic Haplustalfs
Moskee	Fine-loamy, mixed, superactive, mesic Aridic Argiustolls
Muleherder	Loamy-skeletal over fragmental, mixed, superactive, mesic Aridic Haplustepts
Niobrara	Mixed, mesic, shallow Aridic Ustipsamments
*Niobrara	Mixed, mesic, shallow Aridic Ustipsamments
Nuncho	Fine, smectitic, mesic Aridic Argiustolls
Oldwolf	Fine-loamy, mixed, superactive, mesic Aridic Haplustalfs
Orpha	Mixed, mesic Ustic Torripsamments
Oshoto	Fine-silty, mixed, superactive, mesic Aridic Haplustalfs
Parmleed	Fine, smectitic, mesic Ustic Paleargids
Pitchdraw	Coarse-loamy, mixed, superactive, calcareous, mesic Aridic Ustorthents
Platmak	Fine, smectitic, mesic Aridic Paleustolls
Pugsley	Fine-loamy, mixed, superactive, mesic Ustic Haplargids
Rauzi	Fine-loamy, mixed, superactive, mesic Aridic Haplustalfs
Recluse	Fine-loamy, mixed, superactive, mesic Aridic Argiustolls
Renohill	Fine, smectitic, mesic Ustic Haplargids

Classification of the Soils--Continued

Soil name	Family or higher taxonomic class
Rockybutte	Fine-loamy, mixed, superactive, mesic Aridic Haplustalfs
Rockypoint	Fine-loamy, mixed, superactive, calcareous, mesic Aridic Ustifluvents
Sabatka	Fine, smectitic, mesic Aridic Haplustepts
Samday	Clayey, smectitic, calcareous, mesic, shallow Ustic Torriorthents
Samsil	Clayey, smectitic, calcareous, mesic, shallow Aridic Ustorthents
Savageton	Fine, smectitic, mesic Ustic Haplocambids
Shingle	Loamy, mixed, superactive, calcareous, mesic, shallow Ustic Torriorthents
Silhouette	Fine, smectitic, mesic Ustic Haplocambids
Sodawells	Coarse-loamy, mixed, superactive, calcareous, mesic Aridic Ustifluvents
Spottedhorse	Fine, smectitic, mesic Aridic Paleustalfs
Taluce	Loamy, mixed, superactive, calcareous, mesic, shallow Ustic Torriorthents
*Taluce	Loamy, mixed, superactive, nonacid, mesic, shallow Ustic Torriorthents
Teckla	Fine-loamy, mixed, superactive, mesic Ustic Haplargids
Terro	Coarse-loamy, mixed, superactive, mesic Ustic Haplargids
Theedle	Fine-loamy, mixed, superactive, calcareous, mesic Ustic Torriorthents
Torriarents	Torriarents
Torriorthents	Torriorthents
Tullock	Mixed, mesic Ustic Torripsamments
Turnercrest	Coarse-loamy, mixed, superactive, calcareous, mesic Ustic Torriorthents
*Turnercrest	Coarse-loamy, mixed, superactive, nonacid, mesic Ustic Torriorthents
Ucross	Fine-loamy, mixed, superactive, calcareous, mesic Aridic Ustorthents
Ulm	Fine, smectitic, mesic Ustic Haplargids
Ustic Torriorthents	Ustic Torriorthents
Valent	Mixed, mesic Aridic Ustipsamments
Vonalee	Coarse-loamy, mixed, superactive, mesic Ustic Haplargids
Vonalf	Coarse-loamy, mixed, superactive, mesic Aridic Haplustalfs
Wags	Fine, smectitic, nonacid, mesic Ustic Torriorthents
Wibaux	Loamy-skeletal over fragmental, mixed, superactive, nonacid, mesic Ustic Torriorthents
*Wibaux	Loamy-skeletal over fragmental, mixed, superactive, nonacid, mesic Ustic Torriorthents
Worf	Loamy, mixed, superactive, mesic, shallow Ustic Haplargids
Worfka	Clayey, smectitic, mesic, shallow Ustic Haplargids
Wyarno	Fine, smectitic, mesic Ustic Haplargids
Wyotite	Fine-silty, mixed, superactive, mesic Ustic Haplargids
Xema	Coarse-loamy, mixed, superactive, mesic Aridic Haplustalfs
Ziggy	Fine-loamy, mixed, superactive, mesic Aridic Haplustepts
Zigweid	Fine-loamy, mixed, superactive, mesic Ustic Haplocambids

Soil Series and Their Morphology

In this section, each soil series recognized in the survey area is described. Characteristics of the soil and the material in which it formed are identified for each series. A pedon, a small three-dimensional area of soil, that is typical of the series in the survey area is described. The detailed description of each soil horizon follows standards in the "Soil Survey Manual" (USDA, 1993). Many of the technical terms used in the descriptions are defined in "Soil Taxonomy" (USDA, 1999) and in "Keys to Soil Taxonomy" (USDA, 1998). Unless otherwise indicated, colors in the descriptions are for dry soil. Following the pedon description is the range of important characteristics of the soils in the series.

The map units of each soil series are described in the section "Detailed Soil Map Units."

Absted Series

The Absted series consists of very deep, well drained soils on alluvial fans, fan remnants, and stream terraces. The soils formed in alluvium derived from sodic shale. Slopes ranges from 0 to 6 percent. Elevation is 3,500 to 4,500 feet. The average annual precipitation is 10 to 14 inches, the average annual air temperature is 45 to 49 degrees F., and the frost-free period is 105 to 130 days.

Taxonomic Class: Fine, smectitic, mesic Haplic Ustic Natrargids

Typical pedon of Absted fine sandy loam, on a south-facing slope of about 1 percent under native grass vegetation; SE 1/4 of the NE 1/4 of section 32, T. 55 N., R. 79 W.; 44 degrees 42 minutes 49 seconds north latitude and 106 degrees 25 minutes 14 seconds west longitude.

E—0 to 2 inches; light gray (10YR 7/2) fine sandy loam, very dark grayish brown (10YR 3/2) moist; strong thick platy structure parting to strong thin platy; slightly hard, very friable, slightly sticky and nonplastic; common fine and very fine roots; slightly alkaline (pH 7.6); abrupt smooth boundary.

Bt—2 to 8 inches; brown (10YR 5/3) clay, dark grayish brown (10YR 4/2) moist; strong medium columnar structure parting to strong medium and fine angular blocky; very hard, firm, sticky and plastic; few fine and medium roots; many prominent clay films on faces of peds; moderately alkaline (pH 8.2); clear smooth boundary.

Btkn—8 to 13 inches; brown (10YR 5/3) clay, dark grayish brown (10YR 4/2) moist; strong medium angular blocky structure; very hard, friable, sticky and plastic; few fine and medium roots; common distinct clay films on faces of peds; strongly effervescent; calcium carbonate and gypsum as common fine filaments and threads; strongly alkaline (pH 8.8); clear smooth boundary.

Bkn—13 to 60 inches; pale brown (10YR 6/3) clay loam, dark grayish brown (10YR 4/2) moist; moderate coarse subangular blocky structure; very hard, firm, sticky and plastic; strongly effervescent; many prominent threads of calcium carbonate and gypsum; very strongly alkaline (pH 9.0).

Depth to the natric horizon ranges from 6 to 24 inches. Depth to calcium carbonate ranges from 6 to 20 inches. Rock fragments range from 0 to 5 percent.

The Bt horizon texture is clay, clay loam, or silty clay loam. Reaction is slightly alkaline or moderately alkaline. Exchangeable sodium ranges from 5 to 10 percent. Electrical conductivity ranges from 2 to 5 millimhos per centimeter.

The Btkn horizon texture is clay, clay loam, or silty clay. Reaction is strongly or very strongly alkaline. Exchangeable sodium ranges from 15 to 30 percent. Electrical conductivity ranges from 8 to 16 millimhos per centimeter.

The Bkn horizon texture is clay, clay loam, or silty clay. Reaction is moderately alkaline to strongly alkaline. Exchangeable sodium ranges from 10 to 30 percent. Electrical conductivity ranges from 8 to 16 millimhos per centimeter.

Aridic Ustorthents

Aridic Ustorthents consist of very deep, well drained soils on stream terraces. The soils formed in alluvium derived from sodic shale. Slopes range from 0 to 6 percent. Elevation is 4,200 to 4,810 feet. The average annual precipitation is 15 to 17 inches, the average annual air temperature is 45 to 49 degrees F., and the frost-free period is 105 to 130 days.

Taxonomic Class: Aridic Ustorthents

Typical pedon of Aridic Ustorthents loam, in an area of Aridic Ustorthents loam, 0 to 6 percent slopes.

A—0 to 2 inches; light brownish gray (10YR 6/2) loam, grayish brown (10YR 5/2) moist; weak very fine and fine granular structure; soft, very friable, slightly sticky and slightly plastic; slightly alkaline (pH 7.8); abrupt smooth boundary.

Bw—2 to 6 inches; light brownish gray (10YR 6/2) clay loam, grayish brown (10YR 5/2) moist; moderate fine and medium angular blocky structure; hard, firm, moderately sticky and moderately plastic; slightly effervescent; moderately alkaline (pH 8.0); clear wavy boundary.

By1—6 to 21 inches; brown (10YR 5/3) clay loam, stratified with loam, silty clay loam, and clay, brown (10YR 4/3) moist; moderate fine and medium angular blocky structure; slightly hard, friable, moderately sticky and moderately plastic; common fine light gray (10YR 7/2) nests of gypsum throughout; slightly effervescent; moderately alkaline (pH 8.0); clear wavy boundary.

By2—21 to 46 inches; brown (10YR 5/3) clay loam, stratified with loam, silty clay loam, and clay, dark brown (10YR 3/3) moist; moderate fine and medium angular blocky structure; slightly hard, friable, moderately sticky and slightly plastic; common fine light gray (10YR 7/2) nests of gypsum throughout; slightly effervescent; moderately alkaline (pH 8.0); clear wavy boundary.

C—46 to 60 inches; brown (10YR 5/3) sandy clay loam, stratified with fine sandy loam, loam, and clay loam, brown (10YR 4/3) moist; massive; slightly hard, firm, slightly sticky and slightly plastic; slightly effervescent; slightly alkaline (pH 7.4).

Depth to accumulations of calcium carbonate ranges from 3 to 13 inches.

Reaction in the A horizon is neutral or slightly alkaline.

The Bw horizon texture is clay loam, silty clay loam, or sandy clay loam. Reaction is slightly or moderately alkaline. Electrical conductivity ranges from 2 to 4 millimhos per centimeter. Sodium adsorption ratio ranges from 1 to 10.

The By horizon texture is clay loam, stratified with loam, silty clay loam, and clay. Reaction is slightly or moderately alkaline. Electrical conductivity ranges from 8 to 16 millimhos per centimeter. Sodium adsorption ratio ranges from 1 to 13.

The C horizon texture is sandy clay loam, stratified with fine sandy loam, loam, and clay loam. Reaction is slightly or moderately alkaline. Electrical conductivity ranges from 8 to 16 millimhos per centimeter. Sodium adsorption ratio ranges from 1 to 13.

Arvada Series

The Arvada series consists of very deep, well drained soils on alluvial fans, fan remnants, and stream terraces. The soils formed in alluvium derived from sodic shale. Slopes range from 0 to 6 percent. Elevation is 4,100 to 5,000 feet. The average annual precipitation is 10 to 14 inches, the average annual air temperature is 45 to 49 degrees F., and the frost-free period is 105 to 130 days.

Taxonomic Class: Fine, smectitic, mesic Vertic Natrargids

Typical pedon of Arvada fine sandy loam, in an area of Arvada, thick surface-Arvada-Slickspots complex, 0 to 6 percent slopes, about 340 feet west and 780 feet south of the northeast corner of section 36, T. 47 N., R. 71 W.

E—0 to 2 inches; pale brown (10YR 6/3) fine sandy loam, brown (10YR 4/3) moist; weak coarse platy structure parting to weak medium granular; soft, friable, nonsticky and nonplastic; many fine and very fine roots; slightly alkaline; abrupt smooth boundary.

Btn—2 to 9 inches; brown (10YR 5/3) clay, dark brown (10YR 4/3) moist; moderate coarse and medium columnar structure parting to strong medium angular blocky; very hard, firm, sticky and plastic; common fine and very fine roots; common prominent clay films on faces of peds; very strongly alkaline; clear wavy boundary.

Btkn—9 to 15 inches; brown (10YR 5/3) clay, dark brown (10YR 4/3) moist; moderate medium and fine subangular blocky structure; very hard, firm,

sticky and plastic; few fine roots; common prominent clay films on faces of peds; slightly effervescent; many coarse and medium masses of calcium carbonate; strongly alkaline; clear wavy boundary.

Bkny1—15 to 24 inches; brown (10YR 5/3) silty clay loam, dark brown (10YR 4/3) moist; weak medium and fine subangular blocky structure; hard, firm, sticky and plastic; few fine roots; strongly effervescent; common medium masses of calcium carbonate; strongly alkaline; clear wavy boundary.

Bkny2—24 to 44 inches; brown (10YR 5/3) clay loam, dark brown (10YR 4/3) moist; massive; hard, firm, sticky and plastic; few fine roots; strongly effervescent; few medium and common fine filaments and masses of calcium carbonate and gypsum; strongly alkaline; clear wavy boundary.

C—44 to 60 inches; light olive brown (2.5Y 5/4) clay loam, olive brown (2.5Y 4/4) moist; massive; hard, firm, sticky and plastic; few fine roots; strongly effervescent; calcium carbonate disseminated; strongly alkaline.

Depth to accumulations of calcium carbonate ranges from 2 to 13 inches. Depth to the natric horizon commonly ranges from 2 to 8 inches, but may extend to 15 inches in some pedons.

The E horizon texture is fine sandy loam, very fine sandy loam, or loam. Reaction is neutral to moderately alkaline.

Some pedons have a Bt horizon with texture of clay loam or silty clay loam. Reaction is slightly alkaline or moderately alkaline. Electrical conductivity ranges from 0 to 2 millimhos per centimeter. Sodium adsorption ratio ranges from 3 to 10.

The Btn horizon texture is clay loam, silty clay loam, silty clay, or clay. Reaction is strongly alkaline or very strongly alkaline. Electrical conductivity ranges from 2 to 4 millimhos per centimeter. Sodium adsorption ratio ranges from 13 to 30.

The Btkn horizon texture is clay loam, silty clay loam, or clay. Reaction is moderately alkaline to very strongly alkaline. Electrical conductivity ranges from 4 to 12 millimhos per centimeter. Sodium adsorption ratio ranges from 13 to 30.

The Bkny and C horizon textures are clay loam, silty clay loam, or clay. Reaction is moderately alkaline to very strongly alkaline and electrical conductivity ranges from 8 to 16 millimhos per centimeter in both horizons. Sodium adsorption ratio ranges from 10 to 30 in the Bkny horizon and from 10 to 25 in the C horizon.

Arwite Series

The Arwite series consists of very deep, well drained soils on alluvial fans, fan remnants, hills, and ridges. The soils formed in alluvium and eolian deposits derived from mixed sources. Slopes range from 0 to 15 percent. Elevation is 4,300 to 4,800 feet. The average annual precipitation is 15 to 17 inches, the average annual air temperature is 45 to 49 degrees F., and the frost-free period is 105 to 130 days.

Taxonomic Class: Fine-loamy, mixed, superactive, mesic Aridic Haplustalfs

Typical pedon of Arwite fine sandy loam, from an area of Arwite-Elwop fine sandy loams, 6 to 15 percent slopes, about 1,800 feet west and 1,200 feet south of the northeast corner of section 13, T. 56 N., R. 74 W. USGS topographic quadrangle Homestead Draw, SW, Wyoming; 44 degrees 50 minutes 11 seconds north latitude and 105 degrees 42 minutes 16 seconds west longitude.

A—0 to 5 inches; brown (10YR 5/3) fine sandy loam, brown (10YR 4/3) moist; weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine and very fine roots throughout; common fine interstitial pores throughout; neutral (pH 7.0); clear smooth boundary.

Bt1—5 to 14 inches; brown (10YR 5/3) sandy clay loam, brown (10YR 4/3) moist; moderate medium prismatic structure parting to moderate fine and medium angular blocky; hard, firm, moderately sticky and moderately plastic; common distinct discontinuous dark brown (10YR 3/3) clay films on faces of peds; many fine and very fine roots throughout; common fine tubular pores throughout; neutral (pH 7.2); clear wavy boundary.

Bt2—14 to 24 inches; brown (10YR 5/3) sandy clay loam, brown (10YR 4/3) moist; moderate medium prismatic structure parting to moderate fine and medium angular blocky; hard, firm, moderately sticky and moderately plastic; common distinct discontinuous dark brown (10YR 3/3) clay films on faces of peds; many fine and very fine roots throughout; common fine tubular pores throughout; neutral (pH 7.2); gradual wavy boundary.

Btk—24 to 32 inches; light olive brown (2.5Y 5/3) sandy clay loam, olive brown (10YR 4/3) moist; moderate medium angular blocky structure; slightly hard, friable, slightly sticky and slightly

plastic; many distinct discontinuous brown (10YR 4/3) clay films on faces of peds; common fine and very fine roots throughout; common fine tubular pores throughout; few fine light gray (10YR 7/2) irregular carbonate threads throughout; strongly effervescent; moderately alkaline (pH 8.2); clear smooth boundary.

Bk1—32 to 45 inches; light olive brown (2.5Y 5/3) fine sandy loam, olive brown (2.5Y 4/3) moist; moderate medium angular blocky structure; slightly hard, friable, nonsticky and nonplastic; common fine and very fine roots throughout; common fine vesicular pores throughout; few fine light gray (10YR 7/2) irregular carbonate threads throughout; slightly effervescent, moderately alkaline (pH 8.0); clear smooth boundary.

Bk2—45 to 60 inches; light olive brown (2.5Y 5/3) fine sandy loam, olive brown (2.5Y 4/3) moist; weak fine and medium angular blocky structure; slightly hard, friable; few fine and very fine roots throughout; few fine vesicular pores throughout; few fine light gray (10YR 7/2) irregular carbonate threads throughout; slightly effervescent; moderately alkaline (pH 8.0).

Depth to accumulations of carbonates is 25 to 40 inches.

Reaction in the A and Bt horizons is neutral or slightly alkaline. It is slightly alkaline or moderately alkaline in the Btk horizon.

The Bk horizon texture is fine sandy loam or sandy loam. Reaction is slightly alkaline or moderately alkaline.

Ashollow Series

The Ashollow series consists of very deep, well drained, moderately rapidly permeable soils on hills and ridges. They formed in loamy and sandy residuum weathered from calcareous sandstone. Slopes range from 3 to 30 percent. Elevation is 4,300 to 5,200 feet. The average annual precipitation is 15 to 17 inches, the average annual temperature is 45 to 49 degrees F., and the frost-free period is 105 to 130 days.

Taxonomic Class: Coarse-loamy, mixed, superactive, calcareous, mesic Aridic Ustorthents

Typical pedon of Ashollow fine sandy loam, about 700 feet west and 2,300 feet south of the northeast corner of section 28, T. 55 N., R. 73 W.; USGS topographic quadrangle Recluse, WY; 44 degrees 42 minutes 51 seconds north latitude and 105 degrees 38 minutes 29 seconds west longitude.

A—0 to 5 inches; brown (10YR 5/3) fine sandy loam, dark brown (10YR 3/3) moist; weak fine granular structure; loose, very friable, nonsticky and nonplastic; many very fine and fine roots throughout; common fine pores; slightly effervescent; carbonates are disseminated throughout; slightly alkaline; clear smooth boundary.

C1—5 to 28 inches; brown (10YR 5/3) fine sandy loam, brown (10YR 4/3) moist; weak fine and medium angular blocky structure; loose, very friable, nonsticky and nonplastic; many very fine and fine roots throughout; many fine pores; strongly effervescent; carbonates are disseminated throughout; moderately alkaline; gradual wavy boundary.

C2—28 to 60 inches; pale brown (10YR 6/3) fine sandy loam, brown (10YR 4/3) moist; massive; loose, very friable, nonsticky and nonplastic; common very fine and fine roots throughout; common fine pores; common fine irregular light gray (10YR 7/2) carbonate threads throughout; carbonates are disseminated throughout; strongly effervescent; moderately alkaline.

Depth to effervescent layers ranges from 0 to 10 inches.

Reaction in the A horizon is slightly alkaline or moderately alkaline.

The C horizon texture is sandy loam or fine sandy loam. Reaction is slightly alkaline or moderately alkaline.

Bidman Series

The Bidman series consists of very deep, well drained soils on alluvial fans, fan remnants, hills, and ridges. The soils formed in alluvium derived from shale. Slopes range from 0 to 10 percent. Elevation is 4,100 to 5,200 feet. The average annual precipitation is 10 to 17 inches, the average annual air temperature is 45 to 49 degrees F., and the frost-free period is 105 to 130 days.

Taxonomic Class: Fine, smectitic, mesic Ustic Paleargids

Typical pedon of Bidman loam, 0 to 6 percent slopes, about 330 feet east and 250 feet south of the northwest corner of section 1, T. 43 N., R. 76 W.

E—0 to 2 inches; light brownish gray (10YR 6/2) loam, brown (10YR 4/3) moist; weak medium platy structure parting to weak medium granular; soft, very friable, slightly sticky and slightly plastic; neutral; abrupt smooth boundary.

Bt—2 to 21 inches; brown (10YR 5/3) clay, brown (10YR 4/3) moist; strong medium prismatic structure parting to moderate medium angular blocky; slightly hard, very friable, moderately sticky and moderately plastic; few distinct discontinuous dark brown (10YR 3/3) clay films on faces of peds; slightly alkaline; clear wavy boundary.

Btk—21 to 28 inches; light brownish gray (2.5Y 6/2) clay, grayish brown (2.5Y 5/2) moist; strong coarse prismatic structure parting to moderate medium angular blocky; slightly hard, friable, moderately sticky and moderately plastic; few distinct discontinuous dark grayish brown (2.5Y 4/2) clay films on faces of peds; common fine irregular light gray (10YR 7/2) carbonate threads throughout; violently effervescent; moderately alkaline; gradual wavy boundary.

Bk1—28 to 48 inches; grayish brown (2.5Y 5/2) clay loam, dark grayish brown (2.5Y 4/2) moist; moderate coarse angular blocky structure; extremely hard, very firm, moderately sticky and moderately plastic; common fine irregular light gray (10YR 7/2) carbonate threads throughout; strongly effervescent; moderately alkaline; gradual wavy boundary.

Bk2—48 to 60 inches; grayish brown (2.5Y 5/2) clay loam, dark grayish brown (2.5Y 4/2) moist; moderate fine and medium angular blocky structure; extremely hard, very firm, moderately sticky and moderately plastic; common fine irregular light gray (10YR 7/2) carbonate threads throughout; strongly effervescent; moderately alkaline.

Depth to continuous accumulations of calcium carbonate ranges from 8 to 27 inches.

Reaction in the E horizon is slightly acid to slightly alkaline.

The Bt horizon texture is clay loam or clay. Reaction is neutral or slightly alkaline. In the saline map unit, the reaction is slightly alkaline or moderately alkaline, the sodium adsorption ratio is 5 to 10 percent, and the electrical conductivity is 4 to 8 millimhos per centimeter.

The Btk horizon texture is clay loam or clay. Reaction is slightly alkaline or moderately alkaline.

The Bk horizon texture is clay loam, clay, or loam. Reaction is moderately alkaline or strongly alkaline. In the saline phase, the sodium adsorption ratio is 5 to 10 percent and the electrical conductivity is 8 to 16 millimhos per centimeter.

The 2C horizon texture, in the loamy substratum phase, is sandy clay loam or sandy loam. Reaction is moderately alkaline or strongly alkaline. Electrical conductivity is 0 to 2 millimhos per centimeter.

Boruff Series

The Boruff series consists of very deep, poorly and somewhat poorly drained soils on flood plains and stream terraces. The soils formed in alluvium derived from mixed sources. Slopes range from 0 to 3 percent. Elevation is 4,100 to 4,800 feet. Flooding is rare to frequent for very brief or brief periods. Water table is from 0.5 to 1.5 feet. The average annual precipitation is 10 to 17 inches, the average annual air temperature is 45 to 49 degrees F., and the frost-free period is 105 to 130 days.

Taxonomic Class: Fine, smectitic, calcareous, mesic Vertic Fluvaquents

Typical pedon of Boruff silty clay on a west-facing slope of 1 percent in rangeland, about 900 feet east and 2,300 feet north of the southwest corner of section 9, T. 75 N., R. 55 W.; USGS topographic quadrangle Kline Draw, WY; 44 degrees 45 minutes 23 seconds north latitude and 105 degrees 54 minutes 1 second west longitude.

A—0 to 2 inches; olive brown (2.5Y 4/3) silty clay, dark olive brown (2.5Y 3/3) moist; common fine distinct dark yellowish brown (10YR 4/6) redoximorphic concentrations; moderate fine and medium granular structure; slightly hard, friable, moderately sticky and moderately plastic; many very fine and common medium roots throughout; many fine pores; slightly effervescent; slightly alkaline; EC of 3.5; abrupt smooth boundary.

C1—2 to 6 inches; stratified light yellowish brown (2.5Y 6/3) silty clay, light olive brown (2.5Y 5/3) and olive brown (2.5Y 4/3) moist; common fine distinct gray (N 6/0) redoximorphic depletions; common fine prominent dark yellowish brown (10YR 4/6) redoximorphic concentrations; moderate coarse prismatic structure parting to moderate medium subangular blocky; hard, firm, very sticky and very plastic; common very fine and medium roots throughout; many fine pores; few distinct discontinuous dark brown (10YR 3/3) organic coats in root channels and/or pores; common fine irregular white (10YR 8/1) nests of gypsum throughout; slightly effervescent; moderately alkaline; EC of 5; abrupt wavy boundary.

C2—6 to 46 inches; grayish brown (2.5Y 5/2) silty clay, dark grayish brown (2.5Y 4/2) moist; stratified with thin layers of silty clay loam, clay

loam, silt loam, and fine sandy loam; many fine distinct gray (N 5/0) redoximorphic depletions; many fine prominent strong brown (7.5YR 4/6) redoximorphic concentrations; massive; hard, friable, slightly sticky and moderately plastic; common very fine roots throughout; many fine pores; few fine rounded white (10YR 8/1) nests of gypsum throughout; slightly effervescent; moderately alkaline; EC of 6; clear wavy boundary.

C3—46 to 60 inches; light brownish gray (2.5Y 6/2) silty clay, grayish brown (2.5Y 5/2) moist; stratified with thin layers of silty clay loam, clay loam, silt loam, and fine sandy loam; many fine and medium distinct gray (N 5/0) redoximorphic depletions; many fine and medium distinct light olive brown (2.5Y 5/6) and common fine prominent dark yellowish brown (10YR 4/6) redoximorphic concentrations; massive; hard, friable, moderately sticky and moderately plastic; common very fine roots throughout; many fine pores; few fine rounded white (10YR 8/1) nests of gypsum throughout; slightly effervescent; EC of 5.5; moderately alkaline.

Depth to calcium carbonate ranges from 8 to 27 inches. Redoximorphic depletions and concentrations are common in the upper 18 inches.

Reaction in the A horizon is neutral to moderately alkaline. Electrical conductivity is 2 to 4 millimhos per centimeter.

The C horizon texture is silty clay, silty clay loam, or clay loam, stratified with very fine sandy loam, fine sandy loam, sandy loam, loam, silt loam, and loamy fine sand. Reaction is slightly alkaline to strongly alkaline. Electrical conductivity is 4 to 8 millimhos per centimeter.

Bowbac Series

The Bowbac series consists of moderately deep, well drained soils on ridges, buttes, and hills. The soils formed in eolian deposits and residuum derived from sandstone. Slopes range from 0 to 15 percent. Elevation is 4,100 to 6,000 feet. The average annual precipitation is 10 to 14 inches, the average annual air temperature is 45 to 49 degrees F., and the frost-free period is 105 to 130 days.

Taxonomic Class: Fine-loamy, mixed, superactive, mesic Ustic Haplargids

Typical pedon of Bowbac fine sandy loam, in an area of Hiland-Bowbac fine sandy loams, 0 to 6 percent slopes, about 1,250 feet north and 1,350 feet west of the southeast corner of section 23, T. 42 N., R. 72 W.; 43 degrees 35 minutes 45 seconds north latitude and 105 degrees 28 minutes 5 seconds west longitude.

A—0 to 3 inches; brown (10YR 5/3) fine sandy loam, dark brown (10YR 3/3) moist; weak fine and very fine granular structure; soft, very friable, nonsticky and nonplastic; many fine and very fine and few medium and coarse roots; neutral; abrupt wavy boundary.

Bt1—3 to 25 inches; yellowish brown (10YR 5/4) sandy clay loam, brown (10YR 4/3) moist; moderate coarse and medium prismatic structure parting to strong coarse and medium angular blocky; hard, friable, slightly sticky and moderately plastic; common fine and very fine and few coarse and medium roots; many distinct clay films on faces of peds; neutral; clear wavy boundary.

Bt2—25 to 31 inches; yellowish brown (10YR 5/4) sandy clay loam, dark yellowish brown (10YR 4/4) moist; moderate medium and coarse subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; few medium fine and very fine roots; common distinct clay films on faces of peds; slightly alkaline; clear wavy boundary.

Bk—31 to 39 inches; very pale brown (10YR 7/3) sandy loam, brown (10YR 5/3) moist; massive; soft, friable, nonsticky and slightly plastic; few medium, fine, and very fine roots; slightly effervescent; few medium and fine masses of calcium carbonate; moderately alkaline; abrupt smooth boundary.

Cr—39 to 60 inches; slightly hard, slightly effervescent sandstone.

Depth to accumulations of calcium carbonate ranges from 10 to 31 inches. Depth to bedrock ranges from 20 to 40 inches.

The A horizon texture is fine sandy loam or sandy loam. Reaction is neutral or slightly alkaline.

Reaction in the Bt horizon is neutral or slightly alkaline.

The Bk horizon texture is sandy loam or fine sandy loam.

Brislawn Series

The Brislawn series consists of very deep, well drained soils on plateaus and ridges. These soils

formed in alluvium or eolian deposits over weathered porcelanite. Slopes range from 0 to 6 percent. Elevation is 4,100 to 4,800 feet. The average annual precipitation is 15 to 17 inches, the average annual air temperature is 46 to 49 degrees F., and the frost-free period is 105 to 130 days.

Taxonomic Class: Fine, smectitic, mesic Aridic Paleustalfs

Typical pedon of Brislawn loam, in an area of Brislawn-Rockybutte-Ironbutte complex, 0 to 10 percent slopes, about 1,100 feet east and 400 feet south of the northwest corner of section 18, T. 56 N., R. 71 W.; USGS topographic quadrangle Rocky Butte SW, WY; 44 degrees 50 minutes 35 seconds north latitude and 105 degrees 26 minutes 56 seconds west longitude.

E—0 to 6 inches; brown (7.5YR 5/3) loam, dark brown (7.5YR 3/3) moist; weak thin platy structure parting to weak fine granular; soft, friable, slightly sticky and slightly plastic; common very fine and fine roots throughout; common fine pores; 2 percent subangular porcelanite channers; neutral; (pH 6.6); abrupt smooth boundary

Bt1—6 to 14 inches; reddish brown (5YR 4/4) clay, dark reddish brown (5YR 3/4) moist; strong medium and coarse prismatic structure parting to strong fine and medium angular blocky; hard, firm, very sticky and very plastic; common very fine and fine roots throughout; common fine pores; many distinct discontinuous dark reddish brown (5YR 3/3) clay films on faces of peds; 5 percent subangular porcelanite channers; neutral; (pH 7.2); clear wavy boundary.

Bt2—14 to 21 inches; brown (7.5YR 4/3) clay, dark brown (7.5YR 3/3) moist; strong medium and coarse prismatic structure parting to moderate fine and medium angular blocky; hard, firm, very sticky and very plastic; common very fine and fine roots throughout; common fine pores; many distinct discontinuous dark brown (7.5YR 3/2) clay films on faces of peds; 5 percent subangular porcelanite channers; slightly alkaline; (pH 7.6); clear wavy boundary.

2Btk—21 to 31 inches; brown (7.5YR 4/4) channery clay loam, dark brown (7.5YR 3/4) moist; moderate fine and medium angular blocky structure; hard, firm, moderately sticky and moderately plastic; common very fine and fine roots throughout; common fine pores; common distinct discontinuous dark brown (7.5YR 3/3) clay films on faces of peds; few fine irregular light gray (10YR 7/2) carbonate threads throughout; 15 percent subangular porcelanite channers; strongly effervescent; moderately alkaline; (pH 8.0); gradual wavy boundary.

2Bk—31 to 37 inches; brown (7.5YR 5/4) very channery clay loam, brown (7.5YR 4/4) moist; massive; slightly hard, friable, moderately sticky and moderately plastic; few very fine and fine roots throughout; few fine pores; few distinct discontinuous light gray (10YR 7/2) carbonate coats on bottom surfaces of rock fragments; few fine irregular light gray (10YR 7/2) carbonate threads; carbonates are disseminated throughout; strongly effervescent; 40 percent angular porcelanite channers; moderately alkaline; (pH 8.2); clear wavy boundary.

3C—37 to 60 inches; fractured porcelanite with 8 percent interstices or voids filled with light brown (7.5YR 6/4) sandy loam, brown (7.5YR 5/4) moist; common distinct discontinuous light gray (10YR 7/2) carbonate coats on bottom surfaces of rock fragments; slightly effervescent, fine earth material has variable effervescence; 70 percent angular porcelanite channers, 17 percent subangular flagstones, and 5 percent subrounded stones; slightly alkaline.

Depth to accumulations of calcium carbonate ranges from 15 to 28 inches. Depth to strongly contrasting particle size ranges from 20 to 40 inches.

The E horizon has rock fragments that range from 0 to 14 percent. Reaction is slight acid or neutral.

The Bt horizon texture is clay loam or clay. Rock fragments range from 0 to 14 percent porcelanite channers, but some subhorizons may be modified by up to 25 percent channers. Reaction is neutral or slightly alkaline.

The 2Btk horizon texture is clay or clay loam. Rock fragments range from 15 to 50 percent porcelanite channers. Reaction is slightly alkaline or moderately alkaline.

The 2Bk horizon texture is loam or clay. Rock fragments range from 25 to 65 percent porcelanite channers and 0 to 10 percent flagstones.

The 3C horizon texture is fractured porcelanite with less than 10 percent of interstices or voids filled with loam, sandy loam, or loamy sand. Rock fragments range from 60 to 95 percent channers, 0 to 15 percent flagstones, and 0 to 5 percent stones. Reaction is slightly acid to slightly alkaline.

Cambria Series

The Cambria series consists of very deep, well drained soils on alluvial fans, fan remnants, hills, and ridges. The soils formed in alluvium derived from mixed sources. Slopes range from 0 to 15 percent. Elevation is 4,100 to 5,200 feet. The average annual precipitation is 10 to 14 inches, the average annual air temperature is 45 to 49 degrees F., and the frost-free period is 105 to 130 days.

Taxonomic Class: Fine-loamy, mixed, superactive, mesic Ustic Haplargids

Typical pedon of Cambria loam, in an area of Cushman-Cambria loams, 0 to 6 percent slopes, about 1,320 feet east and 2,620 feet south of northwest corner of section 15, T. 44 N., R. 75 W.

A—0 to 2 inches; pale brown (10YR 6/3) loam, brown (10YR 4/3) moist; weak medium platy structure parting to weak medium and moderate fine granular; soft, friable, nonsticky and slightly plastic; many fine and very fine roots; neutral; abrupt smooth boundary.

Bt—2 to 6 inches; yellowish brown (10YR 5/4) clay loam, brown (10YR 4/3) moist; strong fine prismatic structure parting to strong medium and fine angular blocky; hard, friable, slightly sticky and slightly plastic; many fine and very fine roots; many faint and common prominent clay films on faces of peds; slightly alkaline; abrupt smooth boundary.

Btk—6 to 12 inches; pale brown (10YR 6/3) loam, brown (10YR 5/3) moist; moderate medium and fine prismatic structure parting to moderate medium subangular blocky; hard, friable, slightly sticky and slightly plastic; common fine and very fine roots; few faint clay films on faces of peds; strongly effervescent; few medium and fine irregularly shaped masses of calcium carbonate; moderately alkaline; clear wavy boundary.

Bk1—12 to 32 inches; pale brown (10YR 6/3) loam, brown (10YR 5/3) moist; weak coarse and medium subangular blocky structure; hard, friable, slightly sticky and slightly plastic; common fine and very fine roots; strongly effervescent; few medium and many fine filaments and threads of calcium carbonate; moderately alkaline; gradual wavy boundary.

Bk2—32 to 60 inches; light gray (10YR 7/2) loam, brown (10YR 5/3) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; few fine and very fine roots; strongly effervescent; common fine masses of calcium carbonate; strongly alkaline.

Depth to accumulations of calcium carbonate ranges from 3 to 10 inches.

The Bt, Btk, and Bk horizon textures are loam or clay loam. Reaction is neutral or slightly alkaline in the Bt horizon.

Clarkelen Series

The Clarkelen series consists of very deep, well drained soils on flood plains and stream terraces. The soils formed in alluvium derived from mixed sources. Slopes range from 0 to 4 percent. Elevation is 4,100 to 5,000 feet. The average annual precipitation is 10 to 14 inches, the average annual air temperature is 45 to 49 degrees F., and the frost-free period is 105 to 130 days.

Taxonomic Class: Coarse-loamy, mixed, superactive, calcareous, mesic Ustic Torrifluvents

Typical pedon of Clarkelen very fine sandy loam, in an area of Clarkelen-Keeline association, 0 to 6 percent slopes, about 30 feet north and 200 feet east of the southwest corner of section 25, T. 43 N., R. 76 W.

A—0 to 3 inches; light brownish gray (2.5Y 6/2) very fine sandy loam, dark grayish brown (2.5Y 4/2) moist; weak medium and fine platy structure parting to weak fine and very fine granular; soft, friable, nonsticky and nonplastic; few coarse and medium and many fine and very fine roots; slightly effervescent; calcium carbonate disseminated; slightly alkaline; clear smooth boundary.

C1—3 to 31 inches; light brownish gray (2.5Y 6/2) fine sandy loam stratified with thin layers of sandy loam, very fine sandy loam, and loam, olive brown (2.5Y 4/4) moist; massive; soft, friable, nonsticky and nonplastic; few coarse and medium and common fine and very fine roots; slightly effervescent; calcium carbonate disseminated; moderately alkaline; clear smooth boundary.

C2—31 to 60 inches; pale brown (10YR 6/3) sandy loam stratified with thin layers of loamy fine sand, fine sandy loam, and very fine sandy loam, brown (10YR 4/3) moist; few fine strong brown (7.5YR 5/6 and 7.5YR 4/6) redoximorphic concentrations; massive; soft, very friable, nonsticky and nonplastic; few medium and common fine and

very fine roots; slightly effervescent; calcium carbonate disseminated; moderately alkaline.

The soils are commonly effervescent to the surface but may be noneffervescent to 8 inches in some pedons.

The A horizon texture is fine sandy loam or very fine sandy loam. Reaction is slightly alkaline or moderately alkaline.

The C horizon texture is sandy loam or fine sandy loam, and is stratified with thin layers of loamy sand, loamy fine sand, very fine sandy loam, and loam.

Note: The Clarkelen soil in map unit 119 is a taxadjunct to the Clarkelen series. The soil in this map unit is noneffervescent throughout. Reaction in the A horizon is slightly acid or neutral. Reaction in the C horizon is slightly acid through slightly alkaline. This soil is classified as coarse-loamy, mixed, superactive, nonacid, mesic Ustic Torrifluvents.

Cromack Series

The Cromack series consists of moderately deep, well drained soils on hills and ridges. The soils formed in alluvium over residuum derived from shale. Slopes range from 3 to 15 percent. Elevation is 4,300 to 4,800 feet. The average annual precipitation is 15 to 17 inches, the average annual air temperature is 45 to 49 degrees F., and the frost-free period is 105 to 130 days.

Taxonomic Class: Fine, smectitic, mesic Aridic Haplustepts

Typical pedon of Cromack clay loam, about 2,250 feet east and 750 feet north of the southwest corner of section 5, T. 56 N., R. 73 W.; USGS topographic quadrangle Homestead Draw SW, WY; 44 degrees 51 minutes 30 seconds north latitude and 105 degrees 40 minutes 9 seconds west longitude.

A—0 to 6 inches; light olive brown (2.5Y 5/3) clay loam, olive brown (2.5Y 4/3) moist; moderate fine and medium subangular blocky structure parting to weak fine granular; slightly hard, friable, moderately sticky and moderately plastic; carbonates are disseminated throughout; slightly effervescent; 1 percent angular shale chips; slightly alkaline; clear smooth boundary.

Bw—6 to 14 inches; light yellowish brown (2.5Y 6/3) clay, light olive brown (2.5Y 5/3) moist; strong fine and medium subangular blocky structure; hard, firm, moderately sticky and moderately plastic; carbonates disseminated throughout; strongly effervescent; 1 percent angular shale chips; moderately alkaline; gradual wavy boundary.

Bk—14 to 29 inches; light yellowish brown (2.5Y 6/3) clay, light olive brown (2.5Y 5/3) moist; strong medium subangular blocky structure; hard, firm, moderately sticky and moderately plastic; common fine rounded light gray (10YR 7/2) masses of carbonate throughout; strongly effervescent; 1 percent angular shale chips; moderately alkaline; clear wavy boundary.

Cr—29 to 60 inches; pale yellow (2.5Y 7/3) soft calcareous shale, light yellowish brown (2.5Y 6/3) moist.

Depth to bedrock ranges from 20 to 40 inches. Depth to continuous accumulations of carbonate ranges from 0 to 10 inches.

Reaction in the A horizon is neutral to moderately alkaline.

The Bw and Bk horizon textures are clay or clay loam. Reaction is slightly alkaline or moderately alkaline in the Bw horizon.

Cushman Series

The Cushman series consists of moderately deep, well drained soils on ridges, hills, and buttes. The soils formed in alluvium and residuum derived from mixed sources. Slopes range from 0 to 15 percent. Elevation is 4,100 to 5,200 feet. The average annual precipitation is 10 to 14 inches, the average annual air temperature is 45 to 49 degrees F., and the frost-free period is 105 to 130 days.

Taxonomic Class: Fine-loamy, mixed, superactive, mesic Ustic Haplargids

Typical pedon of Cushman loam, in an area of Cushman-Theedle loams, 0 to 6 percent slopes, about 2,000 feet south and 2,050 feet west of the northeast corner of section 10, T. 47 N., R. 71 W.

A—0 to 2 inches; grayish brown (10YR 5/2) loam, dark grayish brown (10YR 4/2) moist; weak fine granular structure; soft, friable, slightly sticky and slightly plastic; many fine and very fine roots; neutral; abrupt smooth boundary.

Bt1—2 to 11 inches; brown (10YR 5/3) loam, dark grayish brown (10YR 4/2) moist; moderate medium angular blocky structure; slightly hard, friable, sticky and plastic; many fine and very fine roots; many faint clay films on faces of peds; slightly alkaline; clear smooth boundary.

Bt2—11 to 19 inches; brown (10YR 5/3) clay loam, dark grayish brown (10YR 4/2) moist; moderate medium prismatic structure parting to moderate medium angular blocky; hard, friable, sticky and plastic; common fine roots; many prominent clay films on faces of peds; slightly alkaline; clear smooth boundary.

Btk—19 to 23 inches; pale brown (10YR 6/3) clay loam, brown (10YR 4/3) moist; moderate medium angular blocky structure; hard, friable, sticky and plastic; few fine and very fine roots; few faint clay films on faces of peds; violently effervescent; common medium irregularly shaped filaments and threads of calcium carbonate; moderately alkaline; abrupt smooth boundary.

Bk—23 to 30 inches; light gray (10YR 7/2) loam, brown (10YR 5/3) moist; massive; slightly hard, very friable, slightly sticky and slightly plastic; few fine and very fine roots; violently effervescent; common medium irregularly shaped filaments and threads of calcium carbonate; moderately alkaline; abrupt smooth boundary.

Cr—30 to 60 inches; soft, effervescent shale.

Depth to accumulations of calcium carbonate ranges from 10 to 26 inches. Depth to bedrock ranges from 20 to 40 inches.

Reaction in the A horizon is neutral or slightly alkaline.

The Bt, Btk, and Bk horizon textures are loam or clay loam. Reaction is neutral or slightly alkaline in the Bt horizon and moderately alkaline or strongly alkaline in the Bk horizon.

Decolney Series

The Decolney series consists of very deep, well drained soils on alluvial fans, fan remnants, hills, and ridges. The soils formed in alluvium and eolian deposits derived from mixed sources. Slopes range from 0 to 15 percent. Elevation is 4,100 to 5,200 feet. The average annual precipitation is 10 to 14 inches, the average annual air temperature is 45 to 49 degrees F., and the frost-free period is 105 to 130 days.

Taxonomic Class: Fine-loamy, mixed, superactive, mesic Ustic Haplargids

Typical pedon of Decolney fine sandy loam, in an area of Decolney-Hiland fine sandy loams, 0 to 6 percent slopes, 2,300 feet east and 2,000 feet south of the northwest corner of section 7, T. 41 N., R. 71 W.; USGS topographic quadrangle Teckla SW, WY; 42 degrees 32 minutes 34 seconds north latitude and 105 degrees 26 minutes 0 seconds west longitude.

A—0 to 3 inches; brown (10YR 5/3) fine sandy loam, brown (10YR 4/3) moist; weak fine granular structure; soft, very friable, nonsticky and nonplastic; many very fine and fine roots throughout; slightly alkaline (pH 7.6); abrupt smooth boundary.

Bt1—3 to 14 inches; dark yellowish brown (10YR 4/4) sandy clay loam, dark yellowish brown (10YR 3/4) moist; moderate coarse prismatic structure parting to moderate coarse subangular blocky; hard, friable, slightly sticky and slightly plastic; common very fine and fine roots throughout; few distinct discontinuous dark brown (10YR 3/3) clay films on faces of peds and lining pores; slightly alkaline (pH 7.8); clear wavy boundary.

Bt2—14 to 22 inches; brown (10YR 5/3) sandy clay loam, brown (10YR 4/3) moist; moderate medium prismatic structure parting to weak fine and medium subangular blocky; slightly hard, friable, slightly sticky and nonplastic; few very fine and fine roots throughout; few distinct discontinuous dark brown (10YR 3/3) clay films on faces of peds and in pores; slightly alkaline (pH 7.8); clear wavy boundary.

C1—22 to 43 inches; brown (10YR 5/3) fine sandy loam, brown (10YR 4/3) moist; massive; slightly hard, friable, nonsticky and nonplastic; many very fine and fine roots throughout; moderately alkaline (pH 7.9); abrupt wavy boundary.

C2—43 to 60 inches; pale brown (10YR 6/3) fine sandy loam, brown (10YR 5/3) moist; massive; slightly hard, friable, nonsticky and nonplastic; many very fine and fine roots throughout; strongly effervescent; calcium carbonate disseminated; moderately alkaline (pH 8.4).

Depth to accumulations of calcium carbonate is 40 to 60 inches or more.

Reaction in the Bt horizon is neutral or slightly alkaline.

The C horizon texture is fine sandy loam or sandy loam. Reaction is slightly alkaline or moderately alkaline.

Deekay Series

The Deekay series consists of very deep, well drained soils on alluvial fans, fan remnants, hills, and ridges. The soils formed in alluvium derived from mixed sources. Slopes range from 0 to 15 percent. Elevation is 4,300 to 4,800 feet. The average annual precipitation is 15 to 17 inches, the average annual air temperature is 45 to 49 degrees F., and the frost-free period is 105 to 130 days.

Taxonomic Class: Fine-loamy, mixed, superactive, mesic Aridic Haplustalfs

Typical pedon of Deekay loam, in an area of Deekay-Moorhead loams, 0 to 6 percent slopes, about 150 feet north and 1,700 feet east of the southwest corner of section 31, T. 49 N., R. 72 W.

A—0 to 4 inches; grayish brown (10YR 5/2) loam, brown (10YR 4/3) moist; moderate fine granular structure; soft, very friable, nonsticky and nonplastic; many very fine and fine and common medium roots throughout; neutral; clear wavy boundary.

Bt1—4 to 8 inches; light brownish gray (10YR 6/2) clay loam, dark grayish brown (10YR 4/2) moist; moderate fine angular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; many very fine and fine and common medium roots throughout; few distinct discontinuous very dark grayish brown (10YR 3/2) clay films on faces of peds and in pores; neutral; clear wavy boundary.

Bt2—8 to 18 inches; brown (10YR 5/3) clay loam, brown (10YR 4/3) moist; moderate medium prismatic structure parting to moderate medium angular blocky; slightly hard, friable, moderately sticky and moderately plastic; many very fine and fine and common medium roots throughout; few distinct discontinuous dark brown (10YR 3/3) clay films on faces of peds; slightly alkaline; clear wavy boundary.

Btk—18 to 24 inches; pale brown (10YR 6/3) clay loam, brown (10YR 5/3) moist; weak medium prismatic structure parting to moderate medium subangular blocky; slightly hard, friable, moderately sticky and slightly plastic; many very fine and fine and common medium roots throughout; few distinct discontinuous dark brown (10YR 3/3) clay films on faces of peds and in pores; common fine irregular light gray (10YR 7/2) carbonate threads throughout; slightly effervescent; moderately alkaline; gradual wavy boundary.

Bk—24 to 60 inches; pale brown (10YR 6/3) loam, brown (10YR 5/3) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; common very fine and fine roots throughout; many fine irregular light gray (10YR 7/2) carbonate threads throughout; strongly effervescent; moderately alkaline.

Depth to accumulations of calcium carbonate ranges from 10 to 30 inches.

The Bt, Btk, and Bk horizon textures are loam or clay loam. Reaction is neutral or slightly alkaline in the Bt horizon and slightly alkaline or moderately alkaline in the Btk horizon.

Draknab Series

The Draknab series consists of very deep, excessively drained soils on flood plains and stream terraces. The soils formed in stratified alluvium derived from sandstone. Slopes range from 0 to 3 percent. Elevation is 4,100 to 5,000 feet. The average annual precipitation is 10 to 14 inches, the average annual air temperature is 45 to 49 degrees F., and the frost-free period is 105 to 130 days.

Taxonomic Class: Sandy, mixed, mesic Ustic Torrifluvents

Typical pedon of Draknab sandy loam, in an area of Clarkelen-Draknab complex, 0 to 3 percent slopes, about 925 feet west and 950 feet north of the southeast corner of section 24, T. 41 N., R. 72 W.

A—0 to 4 inches; brown (10YR 5/3) sandy loam, dark brown (10YR 4/3) moist; weak fine and medium subangular blocky structure parting to single grain; soft, very friable, nonsticky and nonplastic; many medium, fine, and very fine roots; slightly alkaline; clear wavy boundary.

C1—4 to 28 inches; brown (10YR 5/3) loamy sand, stratified with thin layers of sandy loam and fine sandy loam, dark brown (10YR 4/3) moist; massive; soft, very friable, nonsticky and nonplastic; common fine and very fine roots; slightly alkaline; clear wavy boundary.

C2—28 to 36 inches; pale brown (10YR 6/3) sand, stratified with thin layers of loamy sand and sandy loam, brown (10YR 5/3) moist; massive; soft, very friable, nonsticky and nonplastic; few fine and very fine roots; slightly alkaline; clear wavy boundary.

C3—36 to 60 inches; pale brown (10YR 6/3) sand, stratified with thin layers of loamy sand, brown (10YR 5/3) moist; massive; soft, very friable, nonsticky and nonplastic; few very fine roots; slightly alkaline.

The soils are commonly noneffervescent throughout, but may be slightly effervescent below 10 inches in some pedons.

Reaction in the A horizon is neutral or slightly alkaline.

The C horizon texture averages loamy sand or sand and is stratified with thin layers of sandy loam and fine sandy loam. Reaction is slightly alkaline or moderately alkaline.

Note: The Draknab soils in this survey area are

outside the characteristics of the Draknab series. The soils are noneffervescent throughout. This does not affect use, management, or interpretations of this soil.

Echeta Series

The Echeta series consists of very deep, well drained soils on alluvial fans, fan remnants, hills and ridges. The soils formed in alluvium derived primarily from shale. Slopes range from 0 to 15 percent. Elevation is 4,300 to 4,800 feet. The average annual precipitation is 15 to 17 inches, the average annual air temperature is 45 to 49 degrees F., and the frost-free period is 105 to 130 days.

Taxonomic Class: Fine, smectitic, mesic Torrertic Haplustepts

Typical pedon of Echeta clay loam, in an area of Echeta-Cromack clay loams, 6 to 15 percent slopes, about 340 feet east and 750 feet north of the southwest corner of section 1, T. 50 N., R. 73 W.; USGS topographic quadrangle Gillette West, WY; 44 degrees 20 minutes 8 seconds north latitude and 105 degrees 35 minutes 20 seconds west longitude.

A—0 to 3 inches; grayish brown (10YR 5/2) clay loam, dark grayish brown (10YR 4/2) moist; strong fine granular structure; slightly hard, firm, moderately sticky and moderately plastic; many very fine and fine and common medium and coarse roots throughout; carbonates are disseminated throughout; slightly effervescent; slightly alkaline; clear smooth boundary.

Bw1—3 to 7 inches; brown (10YR 5/3) clay loam, brown (10YR 4/3) moist; moderate fine and medium angular blocky structure; hard, firm, moderately sticky and moderately plastic; many very fine and fine and common medium and coarse roots throughout; carbonates are disseminated throughout; slightly effervescent; slightly alkaline; clear smooth boundary.

Bw2—7 to 15 inches; pale brown (10YR 6/3) clay, brown (10YR 5/3) moist; weak coarse prismatic structure parting to moderate medium and coarse angular blocky; very hard, very firm, very sticky and very plastic; many very fine and fine and common medium and coarse roots throughout; carbonates are disseminated throughout; slightly effervescent; moderately alkaline; clear wavy boundary.

Bk1—15 to 37 inches; light brownish gray (2.5Y 6/2) clay, grayish brown (2.5Y 5/2) moist; weak medium and coarse subangular blocky structure; very hard, very firm, very sticky and very plastic; common very fine to medium roots throughout; common fine and medium irregular light gray (10YR 7/2) carbonate threads throughout and common fine and medium rounded light gray (10YR 7/2) masses of carbonate throughout; strongly effervescent; moderately alkaline; clear wavy boundary.

Bk2—37 to 60 inches; light brownish gray (2.5Y 6/2) clay, dark grayish brown (2.5Y 4/2) moist; massive; very hard, firm, very sticky and very plastic; common very fine and fine roots throughout; common fine and medium irregular light gray (10YR 7/2) carbonate threads throughout; strongly effervescent; moderately alkaline.

Depth to effervescent layers ranges from 0 to 10 inches. Cracks .25 to .75 inches wide extend from the surface to 25 inches in some pedons when the soils are dry.

Reaction in the A horizon is neutral or slightly alkaline.

The Bw and Bk horizon textures are clay loam or clay. Reaction is slightly alkaline or moderately alkaline in the Bw horizon.

Elwop Series

The Elwop series consists of moderately deep, well drained soils on hills and ridges. The soils formed in alluvium or eolian deposits over residuum derived from mixed sedimentary sources. Slopes range from 0 to 15 percent. Elevation is 4,300 to 4,800 feet. The average annual precipitation is 15 to 17 inches, the average annual air temperature is 45 to 49 degrees F., and the frost-free period is 105 to 130 days.

Taxonomic Class: Fine-loamy, mixed, superactive, mesic Aridic Haplustalfs

Typical pedon of Elwop fine sandy loam, in an area of Arwite-Elwop sandy loams, 0 to 6 percent slopes, about 500 feet west and 2,300 feet north of the southeast corner of section 7, T. 48 N., R. 71 W.; USGS topographic quadrangle The Gap, WY; 44 degrees 9 minutes 6 seconds north latitude and 105 degrees 25 minutes 31 seconds west longitude.

A—0 to 4 inches; yellowish brown (10YR 5/4) fine sandy loam, brown (10YR 4/3) moist; moderate fine granular structure; soft, friable, nonsticky and nonplastic; neutral; clear smooth boundary.

Bt1—4 to 14 inches; yellowish brown (10YR 5/4) sandy clay loam, dark yellowish brown (10YR 4/4) moist; moderate medium prismatic structure parting to moderate medium subangular blocky; hard, firm, moderately sticky and moderately plastic; few distinct discontinuous dark brown (10YR 3/3) clay films on faces of peds and in pores; neutral; clear smooth boundary.

Bt2—14 to 24 inches; brown (10YR 5/3) sandy clay loam, brown (10YR 4/3) moist; weak fine and medium prismatic structure parting to moderate fine and medium subangular blocky; slightly hard, friable, slightly sticky and slightly plastic; few distinct discontinuous dark brown (10YR 3/3) clay films on faces of peds and in pores; slightly alkaline; clear wavy boundary.

Bk—24 to 35 inches; pale brown (10YR 6/3) fine sandy loam, brown (10YR 5/3) moist; weak fine and medium subangular blocky structure; soft, friable, nonsticky and nonplastic; carbonates are disseminated throughout; strongly effervescent; moderately alkaline; clear wavy boundary.

Cr—35 to 60 inches; soft calcareous sandstone.

Depth to bedrock ranges from 20 to 40 inches. Depth to calcium carbonate is 12 to 34 inches.

Reaction in the Bt horizon is neutral or slightly alkaline.

The Bk horizon texture is fine sandy loam and sandy loam.

Embry Series

The Embry series consists of very deep, well drained soils on dunes, stream terraces, ridges, and hills. The soils formed in alluvium and eolian deposits derived from sandstone. Slopes range from 0 to 15 percent. Elevation is 4,100 to 5,000 feet. The average annual precipitation is 10 to 14 inches, the average annual air temperature is 45 to 49 degrees F., and the frost-free period is 105 to 130 days.

Taxonomic Class: Coarse-loamy, mixed, superactive, nonacid, mesic Ustic Torriorthents

Typical pedon of Embry sandy loam, in an area of Embry-Taluce sandy loams, 3 to 20 percent slopes, about 2,320 feet north and 2,600 feet east of the southwest corner of section 4, T. 43 N., R. 69 W.

A—0 to 6 inches; pale brown (10YR 6/3) sandy loam, brown (10YR 4/3) moist; weak fine and very fine granular structure; soft, very friable, nonsticky and nonplastic; many fine and very fine roots; neutral; clear smooth boundary.

AC—6 to 12 inches; pale brown (10YR 6/3) sandy loam, brown (10YR 5/3) moist; weak medium and fine subangular blocky structure; soft, very friable, nonsticky and nonplastic; common fine and very fine roots; neutral; gradual wavy boundary.

C1—12 to 36 inches; pale brown (10YR 6/3) sandy loam, brown (10YR 5/3) moist; massive; soft, very friable, nonsticky and nonplastic; few fine and common very fine roots; slightly alkaline; gradual wavy boundary.

C2—36 to 60 inches; very pale brown (10YR 7/3) sandy loam, pale brown (10YR 6/3) moist; massive; soft, very friable, nonsticky and nonplastic; common very fine roots; slightly alkaline.

The A horizon texture is sandy loam or fine sandy loam.

The C horizon texture is fine sandy loam and sandy loam. Reaction is neutral or slightly alkaline.

Emigha Series

The Emigha series consists of very deep, well drained soils on stream terraces. The soils formed in alluvium derived from silty shale. Slopes range from 0 to 4 percent. Elevation is 4,100 to 5,200 feet. The average annual precipitation is 10 to 14 inches, the average annual air temperature is 45 to 49 degrees F., and the frost-free period is 105 to 130 days.

Taxonomic Class: Fine-silty, mixed, superactive, mesic Ustifluventic Haplocambids

Typical pedon of Emigha loam, 0 to 3 percent slopes, about 550 feet north and 1,320 feet east of the southwest corner of section 31, T. 46 N., R. 73 W.; 43 degrees 54 minutes 47 seconds north latitude and 105 degrees 41 minutes 4 seconds west longitude.

A—0 to 1 inch; light brownish gray (10YR 6/2) loam, dark grayish brown (10YR 4/2) moist; weak fine platy structure; soft, very friable, slightly sticky and slightly plastic; many fine and very fine roots; slightly alkaline; abrupt smooth boundary.

Bw1—1 to 8 inches; brown (10YR 5/3) silty clay loam, dark brown (10YR 4/3) moist; moderate medium and fine prismatic structure parting to weak fine subangular blocky; hard, friable, sticky and plastic; many fine and very fine roots; slightly effervescent; calcium carbonate disseminated; moderately alkaline; clear smooth boundary.

Bw2—8 to 19 inches; pale brown (10YR 6/3) silty clay loam, brown (10YR 4/3) moist; moderate medium and fine prismatic structure parting to weak fine

subangular blocky; slightly hard, friable, sticky and plastic; common fine and very fine roots; slightly effervescent; few fine seams and masses of calcium carbonate; strongly alkaline; clear smooth boundary.

Bk1—19 to 30 inches; brown (10YR 5/3) silty clay loam, dark brown (10YR 4/3) moist; massive; slightly hard, friable, sticky and plastic; few fine and very fine roots; strongly effervescent; common fine seams and masses of calcium carbonate; strongly alkaline; gradual wavy boundary.

Bk2—30 to 60 inches; pale brown (10YR 6/3) clay loam stratified with thin layers of silt loam, silty clay loam, and loam, dark brown (10YR 4/3) moist; massive; slightly hard, friable, sticky and plastic; few very fine roots; strongly effervescent; many fine seams and masses of calcium carbonate; moderately alkaline.

Depth to stratified layers ranges from 11 to 30 inches. Depth to effervescent horizons ranges from 0 to 3 inches.

The A horizon texture is loam or silty clay loam.

The Bw horizon texture is silty clay loam or clay. Reaction is moderately alkaline or strongly alkaline. Electrical conductivity ranges from 2 to 4 millimhos per centimeter. Sodium adsorption ratio ranges from 1 to 13.

Note: A Bn horizon occurs in place of the Bw horizon in the sodic map unit. Reaction is strongly alkaline or very strongly alkaline. Electrical conductivity ranges from 8 to 16 millimhos per centimeter. Sodium adsorption ratio ranges from 13 to 30.

The Bk horizon texture is silty clay loam or clay loam; stratifications of loam, silt loam, and silty clay occur irregularly in the lower part of this horizon. Reaction is moderately alkaline or strongly alkaline. Electrical conductivity ranges from 4 to 8 millimhos per centimeter. Sodium adsorption ratio ranges from 1 to 13.

Note: A Bkn horizon occurs in place of the Bk horizon in the sodic map unit. Reaction is very strongly alkaline. Electrical conductivity ranges from 8 to 16 millimhos per centimeter. Sodium adsorption ratio ranges from 13 to 25.

Fairburn Series

The Fairburn series consists of shallow, well drained soils on hills and ridges. The soils formed in residuum derived from shale and sandstone. Slopes range from 3 to 60 percent. Elevation is 4,300 to 4,800 feet. The average annual precipitation is 15 to 17 inches, the average annual air temperature is 45 to 49 degrees F., and the frost-free period is 105 to 130 days.

Taxonomic Class: Loamy, mixed, superactive, calcareous, mesic, shallow Aridic Ustorthents

Typical pedon of Fairburn loam, in an area of Ucross-Iwait-Fairburn loams, 3 to 30 percent slopes, about 2,700 feet east and 2,200 feet south of the northwest corner of section 23, T. 56 N., R. 74 W.; USGS topographic quadrangle Homestead Draw SW, WY; 44 degrees 48 minutes 32 seconds north latitude and 105 degrees 42 minutes 52 seconds west longitude.

A—0 to 4 inches; light olive brown (2.5Y 5/3) loam, olive brown (2.5Y 4/3) moist; weak fine and medium subangular blocky structure parting to weak fine granular; soft, very friable, slightly sticky and slightly plastic; many very fine and fine roots throughout; common very fine and fine pores; strongly effervescent; moderately alkaline; clear wavy boundary.

C—4 to 15 inches; light olive brown (2.5Y 5/4) loam, olive brown (2.5Y 4/4) moist; moderate fine and medium subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; many very fine and fine roots throughout; many very fine and fine pores; common fine irregular light gray (10YR 7/2) carbonate threads throughout; strongly effervescent; 2 percent gravel; moderately alkaline; abrupt wavy boundary.

Cr—15 to 60 inches; soft shale interbedded with sandstone.

Depth to bedrock is 10 to 20 inches. Depth to calcium carbonate is 0 to 4 inches.

Reaction in the A horizon is neutral to moderately alkaline.

The C horizon texture is clay loam or loam. Rock fragments range from 0 to 15 percent. Reaction is slightly alkaline to moderately alkaline.

Felix Series

The Felix series consists of very deep, poorly drained soils in depressions and playas. The soils formed in local alluvium derived from shale. Slopes range from 0 to 2 percent. Elevation is 4,100 to 5,200 feet. The average annual precipitation is 12 to 16 inches, the average annual air temperature is 45 to 49 degrees F., and the frost-free period is 105 to 130 days.

Taxonomic Class: Very fine, smectitic, mesic Aridic Epiaquerts

Typical pedon of Felix clay, ponded, about 2,200 feet east and 800 feet south of the northwest corner of section 10, T. 55 N., R. 73 W.; USGS topographic quadrangle Homestead Draw SW, WY; 44 degrees 45 minutes 57 seconds north latitude and 105 degrees 37 minutes 40 seconds west longitude

A—0 to 2 inches; dark gray (5Y 4/1) clay, gray (5Y 6/1) dry; common fine and medium prominent strong brown (7.5YR 4/6) redoximorphic concentrations; strong fine and medium angular blocky structure; very hard, very firm, very sticky and very plastic; many very fine roots throughout; common very fine tubular pores; neutral; clear wavy boundary.

BA—2 to 5 inches; very dark gray (5Y 3/1) clay, dark gray (5Y 4/1) dry (B), dark gray (5Y 4/1), gray (5Y 6/1) dry (E); common fine prominent strong brown (7.5YR 4/6) and few medium prominent brown (7.5YR 4/4) redoximorphic concentrations; strong medium prismatic structure parting to strong fine and medium angular blocky; very hard, very firm, very sticky and very plastic; common very fine and fine roots throughout; common very fine tubular pores; few distinct discontinuous gray (5Y 6/1) skeletans on faces of peds; neutral; clear wavy boundary.

Bss1—5 to 20 inches; very dark gray (5Y 3/1) clay, dark gray (5Y 4/1) dry; common fine prominent strong brown (7.5YR 4/6) redoximorphic concentrations; strong coarse prismatic structure parting to strong fine and medium angular blocky; very hard, very firm, very sticky and very plastic; common very fine and fine roots throughout; common very fine tubular pores; few distinct continuous black (5Y 2/1) intersecting slickensides throughout; neutral; clear wavy boundary.

Bss2—20 to 30 inches; very dark gray (5Y 3/1) clay, dark gray (5Y 4/1) dry; common fine prominent brown (7.5YR 4/4) redoximorphic concentrations; strong coarse prismatic structure parting to strong fine and medium angular blocky; very hard, very firm, very sticky and very plastic; common very fine and fine roots throughout; many very fine tubular pores; few distinct discontinuous very dark gray (5Y 3/1) intersecting slickensides throughout; neutral; gradual wavy boundary.

By—30 to 50 inches; dark olive gray (5Y 3/2) clay, olive gray (5Y 4/2) dry; common fine prominent strong brown (7.5YR 5/8) redoximorphic concentrations; weak very coarse prismatic structure parting to moderate fine and medium angular blocky; hard, friable, very sticky and very plastic; common very fine and fine roots throughout; many very fine tubular pores; common fine and medium irregular light gray (10YR 7/2) masses of gypsum throughout; very slightly effervescent; moderately alkaline; clear wavy boundary.

Bky—50 to 60 inches; very dark grayish brown (2.5Y 3/2) clay, dark grayish brown (2.5Y 4/2) dry; moderate medium and coarse prismatic structure parting to moderate fine and medium angular blocky; hard, friable, very sticky and very plastic; common very fine and fine roots throughout; common very fine tubular pores; common fine irregular light gray (10YR 7/2) masses of gypsum throughout; common fine irregular white (10YR 8/1) carbonate threads throughout; slightly effervescent; moderately alkaline; clear wavy boundary.

Cracks 1/2 to 1 inch wide are present from the surface to 20 inches or more for 6 to 8 months. A seasonal high water table of 0 to 18 inches occurs during March through June in most years.

Reaction in the A horizon is medium acid to neutral.

Reaction in the Bss and By horizons is neutral or slightly alkaline.

Reaction in the Bky and C horizons is slightly alkaline or moderately alkaline.

Forkwood Series

The Forkwood series consists of very deep, well drained soils on alluvial fans, fan remnants, hills, and ridges. The soils formed in alluvium derived from mixed sources. Slopes range from 0 to 15 percent. Elevation is 4,100 to 5,200 feet. The average annual precipitation is 10 to 14 inches, the average annual air temperature is 45 to 49 degrees F., and the frost-free period is 105 to 130 days.

Taxonomic Class: Fine-loamy, mixed, superactive, mesic Ustic Haplargids

Typical pedon of Forkwood loam, 0 to 6 percent slopes, about 1,000 feet west and 2,500 feet north of the southeast corner of section 23, T. 46 N., R. 75 W.

A—0 to 2 inches; grayish brown (10YR 5/2) loam, very dark grayish brown (10YR 3/2) moist; moderate fine granular structure; soft, friable, slightly sticky and slightly plastic; many fine and very fine roots; neutral; abrupt wavy boundary.

Bt1—2 to 7 inches; brown (10YR 5/3) clay loam, dark brown (10YR 4/3) moist; weak medium subangular blocky structure parting to moderate fine granular; slightly hard, friable, slightly sticky and plastic; common fine and very fine roots; many prominent clay films on faces of peds; neutral; abrupt wavy boundary.

Bt2—7 to 16 inches; brown (10YR 5/3) clay loam, dark brown (10YR 4/3) moist; strong fine prismatic structure parting to strong medium and fine angular blocky; hard, firm, sticky and plastic; common fine and very fine roots; many distinct clay films on faces of peds; slightly alkaline; clear wavy boundary.

Btk—16 to 23 inches; pale brown (10YR 6/3) clay loam, brown (10YR 5/3) moist; strong medium and fine prismatic structure parting to strong medium and fine angular blocky; hard, firm, sticky and plastic; few fine and very fine roots; many prominent clay films on faces of peds; strongly effervescent; few fine filaments of calcium carbonate; moderately alkaline; clear wavy boundary.

Bk1—23 to 41 inches; pale brown (10YR 6/3) clay loam, brown (10YR 5/3) moist; weak coarse and medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; few fine and very fine roots; strongly effervescent; common fine filaments, seams, and masses of calcium carbonate; moderately alkaline; gradual wavy boundary.

Bk2—41 to 60 inches; pale brown (10YR 6/3) loam, brown (10YR 5/3) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; few fine and very fine roots; strongly effervescent; common fine filaments, seams, and masses of calcium carbonate; strongly alkaline.

Depth to accumulations of calcium carbonate ranges from 12 to 33 inches.

Reaction in the A horizon is neutral or slightly alkaline.

The Bt horizon texture is loam or clay loam. Reaction is neutral or slightly alkaline.

The Btk and Bk horizon textures are loam or clay loam.

Gateson Series

The Gateson series consists of moderately deep, well drained soils on hills and ridges. The soils formed in residuum derived from sandstone and shale. Slopes range from 6 to 30 percent. Elevation is 4,100 to 5,200 feet. The average annual precipitation is 12 to 14 inches, the average annual air temperature is 45 to 49 degrees F., and the frost-free period is 105 to 130 days.

Taxonomic Class: Fine-loamy, mixed, superactive, mesic Aridic Haplustalfs

Typical pedon of Gateson loamy fine sand, in an area of Gateson-Taluce-Turnercrest complex, 6 to 30 percent slopes, about 950 feet south and 1,400 feet east of the northwest corner of section 22, T. 45 N., R. 69 W.

Oi—0 inches to 2; pine needles and duff.

E—2 to 6 inches; light brownish gray (10YR 6/2) loamy fine sand, dark grayish brown (10YR 4/2) moist; weak fine subangular blocky structure parting to weak very fine granular; soft, very friable, nonsticky and nonplastic; few fine and very fine roots; neutral; clear wavy boundary.

E/B—6 to 11 inches; 50 percent light brownish gray (10YR 6/2) loamy fine sand (E), dark grayish brown (10YR 4/2) moist; 50 percent brown (10YR 5/3) sandy clay loam lamellae 1/4 to 1/2 inch thick(B), dark brown (10YR 4/3) moist; weak medium and fine subangular blocky structure; slightly hard, very friable, slightly sticky and nonplastic; few coarse, medium, and fine roots; neutral; clear wavy boundary.

Bt—11 to 30 inches; brown (10YR 5/3) sandy clay loam, dark brown (10YR 4/3) moist; weak medium subangular blocky structure; hard, friable, slightly sticky and slightly plastic; few coarse, medium, and fine roots; few faint clay films bridging sand grains; slightly alkaline; gradual wavy boundary.

Cr—30 to 60 inches; soft sandstone.

Depth to bedrock ranges from 20 to 40 inches. Rock fragments range from 0 to 10 percent angular sandstone and shale channers.

Reaction in the E horizon is slightly acid or neutral.

The E/B horizon is comprised of 50 to 70 percent E horizon material and 30 to 50 percent B horizon material. Reaction is slightly acid or neutral.

Reaction in the Bt horizon is neutral or slightly alkaline.

Haverdad Series

The Haverdad series consists of very deep, well drained soils on flood plains and stream terraces. The soils formed in alluvium derived from mixed sources. Slopes range from 0 to 4 percent. Elevation is 4,100

to 5,000 feet. The average annual precipitation is 10 to 14 inches, the average annual air temperature is 45 to 49 degrees F., and the frost-free period is 105 to 130 days.

Taxonomic Class: Fine-loamy, mixed, superactive, calcareous, mesic Ustic Torrifluvents

Typical pedon of Haverdad loam, 0 to 3 percent slopes, about 50 feet east and 1,100 feet north of the southwest corner of section 34, T. 42 N., R. 76 W.

A—0 to 4 inches; pale brown (10YR 6/3) loam, brown (10YR 4/3) moist; weak platy structure parting to weak fine granular; soft, friable, nonsticky and slightly plastic; few medium and many fine and very fine roots; slightly effervescent; calcium carbonate disseminated; slightly alkaline; clear wavy boundary.

C—4 to 60 inches; pale brown (10YR 6/3) loam, stratified with thin layers of fine sandy loam, very fine sandy loam, sandy clay loam, and silt loam, brown (10YR 5/3) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; few medium and common fine and very fine roots; strongly effervescent; calcium carbonate disseminated; moderately alkaline.

Depth to effervescent layers is 0 to 8 inches.

The A horizon texture is loam or clay loam. Reaction is slightly alkaline or moderately alkaline.

The C horizon texture is loam or clay loam, stratified with very fine sandy loam, fine sandy loam, silt loam, silty clay loam, and sandy clay loam. Reaction is slightly alkaline or moderately alkaline.

Heldt Series

The Heldt series consists of very deep, well drained soils on alluvial fans, fan remnants, and stream terraces. The soils formed in alluvium derived from shale. Slopes range from 0 to 6 percent. Elevation is 4,100 to 5,000 feet. The average annual precipitation is 10 to 14 inches, the average annual air temperature is 45 to 49 degrees F., and the frost-free period is 105 to 130 days.

Taxonomic Class: Fine, smectitic, mesic Ustertic Haplocambids

Typical pedon of Heldt clay loam, 0 to 6 percent slopes, about 700 feet south and 1,350 feet west of the northeast corner of section 9, T. 42 N., R. 71 W.

A—0 to 3 inches; brown (10YR 5/3) clay loam, dark brown (10YR 4/3) moist; strong medium and fine granular structure; hard, firm, sticky and plastic; many medium and fine roots; slightly alkaline; clear smooth boundary.

Bw1—3 to 10 inches; brown (10YR 5/3) clay, dark brown (10YR 4/3) moist; moderate medium prismatic structure parting to moderate medium subangular blocky; extremely hard, very firm, very sticky and very plastic; few medium and fine roots; slightly effervescent; calcium carbonate disseminated; moderately alkaline; clear wavy boundary.

Bw2—10 to 25 inches; brown (10YR 5/3) clay, dark brown (10YR 4/3) moist; weak coarse and medium subangular blocky structure; extremely hard, very firm, very sticky and very plastic; few medium and fine roots; slightly effervescent; calcium carbonate disseminated; moderately alkaline; gradual wavy boundary.

Bk1—25 to 37 inches; brown (10YR 5/3) silty clay, dark brown (10YR 4/3) moist; massive; very hard, firm, very sticky and very plastic; few medium and fine roots; slightly effervescent; many medium and fine masses of calcium carbonate; moderately alkaline; gradual wavy boundary.

Bk2—37 to 60 inches; brown (10YR 5/3) clay loam, dark brown (10YR 4/3) moist; massive; very hard, firm, sticky and plastic; few medium and fine roots; slightly effervescent; few medium and fine masses of calcium carbonate; moderately alkaline.

Cracks 1/2 to 1 inch wide are present from the surface to 25 inches or more for 6 to 8 months.

Reaction in the A horizon is slightly alkaline or moderately alkaline. In the saline phase, reaction is moderately alkaline or strongly alkaline.

The Bw horizon texture is clay or silty clay. Reaction is moderately alkaline or strongly alkaline. Electrical conductivity is 2 to 4 millimhos per centimeter; in the saline phase, it ranges from 8 to 16 millimhos per centimeter. Sodium adsorption ratio is 1 to 5; in the saline phase, it is 1 to 13.

The Bk horizon texture is clay or clay loam. Reaction is moderately alkaline or strongly alkaline. Electrical conductivity is 0 to 4 millimhos per centimeter, in the saline phase, it is 8 to 16 millimhos per centimeter. Sodium adsorption ratio is 1 to 5, in the saline phase, it is 1 to 13.

Hiland Series

The Hiland series consists of very deep, well drained soils on alluvial fans, fan remnants, hills, and ridges. The soils formed in alluvium and eolian deposits derived from mixed sources. Slopes range from 0 to 15 percent. Elevation is 4,100 to 5,300 feet. The average annual precipitation is 10 to 14 inches,

the average annual air temperature is 45 to 49 degrees F., and the frost-free period is 105 to 130 days.

Taxonomic Class: Fine-loamy, mixed, superactive, mesic Ustic Calciargids

Typical pedon of Hiland fine sandy loam, in an area of Hiland-Bowbac fine sandy loams, 6 to 15 percent slopes, about 1,000 feet east and 2,000 feet north of the southwest corner of section 31, T. 43 N., R. 73 W.

A—0 to 2 inches; brown (10YR 5/3) fine sandy loam, brown (10YR 4/3) moist; weak very fine and fine granular structure; soft, very friable, nonsticky and nonplastic; neutral; abrupt smooth boundary.

Bt1—2 to 5 inches; yellowish brown (10YR 5/4) sandy clay loam, brown (10YR 4/3) moist; moderate medium prismatic structure parting to moderate medium subangular blocky; slightly hard, friable, slightly sticky and slightly plastic; few distinct discontinuous dark brown (10YR 3/3) clay films on faces of peds; neutral; clear wavy boundary.

Bt2—5 to 14 inches; yellowish brown (10YR 5/4) sandy clay loam, dark yellowish brown (10YR 4/4) moist; strong medium prismatic structure parting to moderate medium subangular blocky; hard, firm, slightly sticky and slightly plastic; few distinct discontinuous dark brown (10YR 3/3) clay films on faces of peds; neutral; clear wavy boundary.

Btk—14 to 19 inches; pale brown (10YR 6/3) sandy clay loam, brown (10YR 5/3) moist; moderate medium prismatic structure parting to weak medium subangular blocky; slightly hard, friable, slightly sticky and slightly plastic; few distinct discontinuous dark brown (10YR 3/3) clay films on faces of peds; common fine irregular light gray (10YR 7/2) carbonate threads throughout; strongly effervescent; moderately alkaline; gradual wavy boundary.

Bk1—19 to 38 inches; very pale brown (10YR 7/3) sandy clay loam, brown (10YR 5/3) moist; moderate medium subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; common fine irregular light gray (10YR 7/2) carbonate threads throughout; strongly effervescent; moderately alkaline; gradual wavy boundary.

Bk2—38 to 60 inches; pale brown (10YR 6/3) sandy loam, brown (10YR 5/3) moist; moderate medium subangular blocky structure; soft, friable, nonsticky and nonplastic; common fine irregular light gray (10YR 7/2) carbonate threads throughout; strongly effervescent; moderately alkaline.

Depth to accumulations of calcium carbonate ranges from 14 to 32 inches.

Reaction in the Bt horizon is neutral or slightly alkaline.

Hilight Series

The Hilight series consists of shallow, well drained soils on breaks, ridges, and hills. The soils formed in residuum derived from shale. Slopes range from 3 to 45 percent. Elevation is 4,100 to 5,200 feet. The average annual precipitation is 10 to 16 inches, the average annual air temperature is 45 to 49 degrees F., and the frost-free period is 105 to 130 days.

Taxonomic Class: Clayey, smectitic, nonacid, mesic, shallow Ustic Torriorthents

Typical pedon of Hilight clay, in an area of Hilight-Wags-Rock outcrop complex, 3 to 45 percent slopes, about 950 feet east and 2,500 feet north of the southwest corner of section 24, T. 42 N., R. 70 W.

A—0 to 2 inches; grayish brown (2.5Y 5/2) clay, dark grayish brown (2/5Y 4/2) moist; moderate medium and strong fine granular structure; slightly hard, firm, sticky and plastic; common fine roots; neutral; clear wavy boundary.

C—2 to 12 inches; grayish brown (2.5Y 5/2) clay, dark grayish brown (2.5Y 4/2) moist; massive; very hard, very firm, very sticky and very plastic; few fine roots; 30 percent soft shale platelets and 5 percent hard shale channers; neutral; clear wavy boundary.

Cr—12 to 60 inches; soft grayish brown to dark yellowish brown lignitic shale.

Depth to bedrock ranges from 10 to 20 inches.

The A horizon texture is clay loam or clay. Reaction is slightly acid to slightly alkaline.

The C horizon texture is silty clay or clay. Reaction is neutral or slightly alkaline. Rock fragments range from 0 to 15 percent soft fine shale channers. Authigenic gypsum may be present immediately above the bedrock in some pedons.

Ironbutte Series

The Ironbutte series consists of very deep, well drained soils on hills and ridges. The soils formed in colluvium and alluvium derived from porcelanite. Slopes range from 3 to 60 percent. Elevation is 4,100

to 4,800 feet. The average annual precipitation is 15 to 17 inches, the average annual air temperature is 45 to 49 degrees F., and the frost-free period is 105 to 130 days.

Taxonomic Class: Loamy-skeletal over fragmental, mixed, superactive, nonacid, mesic Aridic Ustorthents

Typical pedon of Ironbutte channery loam, in an area of Ironbutte-Ironbutte, thin solum, channery loams, 6 to 40 percent slopes, 660 feet north and 250 feet west of the southeast corner of section 19, T. 50 N., R. 71 W.; USGS topographic quadrangle Gillette East, WY; 44 degrees 17 minutes 33 seconds north latitude and 105 degrees 25 minutes 47 seconds west longitude.

A—0 to 4 inches; light reddish brown (5YR 6/3) channery loam, reddish brown (5YR 4/3) moist; moderate very fine granular structure; soft, very friable; 20 percent channers; slightly alkaline (pH 7.4); clear smooth boundary.

C—4 to 12 inches; light reddish brown (5YR 6/4) very channery loam, reddish brown (5YR 4/4) moist; massive; soft, very friable; 55 percent channers 1/2 to 5 inches in length; slightly alkaline (pH 7.4); clear wavy boundary.

2C—12 to 60 inches; fractured porcelanite. Intricacies between coarse fragments are void of fines.

Depth to fragmental material ranges from 7 to 20 inches.

Reaction in the A horizon is neutral or slightly alkaline. Rock fragments range from 5 to 40 percent, with 0 to 5 percent flagstone porcelanite fragments.

The C horizon texture is very channery loam or extremely channery loam. Reaction is neutral to moderately alkaline. Rock fragments range from 35 to 90 percent, with 0 to 15 percent flagstones and 0 to 5 percent stones.

Iwait Series

The Iwait series consists of very deep, well drained soils on alluvial fans, fan remnants, stream terraces, hills, and ridges. The soils formed in alluvium derived from mixed sources. Slopes range from 0 to 20 percent. Elevation is 4,300 to 4,800 feet. The average annual precipitation is 15 to 17 inches, the average annual air temperature is 45 to 49 degrees F., and the frost-free period is 105 to 130 days.

Taxonomic Class: Fine-loamy, mixed, superactive, calcareous, mesic Aridic Ustorthents

Typical pedon of Iwait loam, in an area of Ziggy-Iwait loams, 0 to 6 percent slopes, about 1,340 feet north and 1,750 feet west of the southeast corner of section 5, T. 55 N., R. 72 W.; USGS topographic quadrangle Whitetail Butte, WY; 44 degrees 46 minutes 30 seconds N. latitude and 105 degrees 32 minutes 24 seconds W. longitude.

A—0 to 6 inches; pale brown (10YR 6/3) loam, brown (10YR 4/3) moist; weak fine granular structure; slightly hard, friable, slightly sticky and slightly plastic; many very fine and fine roots throughout; strongly effervescent; carbonates are disseminated throughout; slightly alkaline; clear smooth boundary.

Bk1—6 to 20 inches; brown (10YR 5/3) loam, brown (10YR 4/3) moist; weak fine subangular blocky structure; soft, friable, slightly sticky and slightly plastic; common very fine and fine roots throughout; common fine irregular light gray (10YR 7/2) carbonate threads throughout and common fine rounded light gray (10YR 7/2) masses of carbonate throughout; strongly effervescent; moderately alkaline; gradual wavy boundary.

Bk2—20 to 60 inches; light yellowish brown (10YR 6/4) clay loam, brown (10YR 5/3) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; few very fine and fine roots throughout; common fine irregular light gray (10YR 7/2) carbonate threads throughout and common fine rounded light gray (10YR 7/2) masses of carbonate throughout; strongly effervescent; moderately alkaline.

Depth to calcium carbonate accumulations is 0 to 6 inches.

Reaction in the A horizon is neutral to moderately alkaline.

The Bk horizon texture is loam or clay loam. Electrical conductivity is 0 to 2 millimhos per cm.; in mapping unit 203, it is 2 to 4 millimhos per cm.

Jayem Series

The Jayem series consists of very deep, well drained soils on the leeward side of hills. The soils formed in eolian deposits derived from sandstone. Slopes range from 6 to 20 percent. Elevation is 4,100 to 5,200 feet. The average annual precipitation is 15 to 17 inches, the average annual air temperature is 45 to 49 degrees F., and the frost-free period is 105 to 130 days.

Taxonomic Class: Coarse-loamy, mixed, superactive, mesic Aridic Haplustolls

Typical pedon of Jayem fine sandy loam, 6 to 20 percent slopes, about 500 feet east and 500 feet north of the southwest corner of section 12, T. 45 N., R. 75 W.

A1—0 to 7 inches; brown (10YR 4/3) fine sandy loam, dark brown (10YR 3/3) moist; weak medium and fine granular structure; soft, very friable, nonsticky and nonplastic; few medium and many fine and very fine roots; neutral; clear smooth boundary.

A2—7 to 17 inches; dark grayish brown (10YR 4/2) fine sandy loam, very dark grayish brown (10YR 3/2) moist; weak fine subangular blocky structure parting to weak fine granular; soft, very friable, nonsticky and nonplastic; few medium and common fine and very fine roots; neutral; clear wavy boundary.

Bw—17 to 31 inches; yellowish brown (10YR 5/4) fine sandy loam, brown (10YR 4/3) moist; weak coarse prismatic structure parting to weak medium subangular blocky; slightly hard, friable, nonsticky and nonplastic; few medium and common fine and very fine roots; neutral; gradual wavy boundary.

C—31 to 60 inches; yellowish brown (10YR 5/4) fine sandy loam, brown (10YR 4/3) moist; massive; soft, friable; nonsticky and nonplastic; few medium, fine, and very fine roots; neutral.

The mollic epipedon is 10 to 17 inches thick.

The Bw and C horizon textures are fine sandy loam or sandy loam. Reaction is neutral or slightly alkaline in the C horizon.

Jaywest Series

The Jaywest series consists of very deep, well drained soils on alluvial fans, fan remnants, hills, and ridges. The soils formed in alluvium derived from shale. Slopes range from 0 to 6 percent. Elevation is 4,300 to 4,800 feet. The average annual precipitation is 15 to 17 inches, the average annual air temperature is 45 to 49 degrees F., and the frost-free period is 105 to 130 days.

Taxonomic Class: Fine, smectitic, mesic Aridic Paleustalfs

Typical pedon of Jaywest loam, 0 to 6 percent slopes, about 500 feet north and 450 feet west of the southeast corner of section 4, T. 49 N., R. 73 W.; USGS topographic quadrangle Four Bar J Ranch, WY; 44 degrees 14 minutes 48 seconds north latitude and 105 degrees 37 minutes 59 seconds west longitude.

E—0 to 7 inches; pale brown (10YR 6/3) loam, brown (10YR 4/3) moist; moderate thick platy structure; soft, friable, slightly sticky and slightly plastic; many fine and very fine and few medium roots; neutral (pH 6.8); abrupt wavy boundary.

Bt1—7 to 12 inches; brown (10YR 5/3) clay loam, dark yellowish brown (10YR 4/4) moist; moderate fine and medium subangular blocky structure; hard, firm, moderately sticky and moderately plastic; many fine and very fine and few medium roots; neutral; abrupt smooth boundary.

Bt2—12 to 27 inches; yellowish brown (10YR 5/4) clay, dark yellowish brown (10YR 4/4) moist; strong coarse prismatic structure parting to strong coarse and medium angular blocky; extremely hard, very firm, very sticky and very plastic; common fine and very fine and few medium roots; many faint dark brown (10YR 3/3) clay films on faces of peds and lining pores; neutral; clear wavy boundary.

Btk—27 to 36 inches; light yellowish brown (10YR 6/4) clay, yellowish brown (10YR 5/4) moist; moderate medium and fine prismatic structure parting to strong medium angular blocky; very hard, very firm, very sticky and very plastic; few medium, fine and very fine roots; few faint dark brown (10YR 3/3) clay films on faces of peds; common fine irregular light gray (10YR 7/2) carbonate threads; strongly effervescent; moderately alkaline; clear wavy boundary.

Bk—36 to 60 inches; light yellowish brown (10YR 6/4) clay loam, yellowish brown (10YR 5/4) moist; weak coarse and medium subangular blocky structure; hard, firm, sticky and plastic; few fine and very fine roots; common fine irregular light gray (10YR 7/2) carbonate threads and common fine rounded light gray (10YR 7/2) masses of carbonate; strongly effervescent; moderately alkaline.

Depth to calcium carbonate accumulations ranges from 13 to 27 inches.

Reaction in the E horizon is slightly acid or neutral.

The Bt and Btk horizon textures are clay loam or clay. Reaction is neutral or slightly alkaline.

The Bk horizon texture is clay loam or loam.

Julesburg Series

The Julesburg series consists of very deep, well drained soils on alluvial fans and fan remnants. The soils formed in alluvium and eolian deposits derived from sandstone. Slopes range from 0 to 6 percent.

Elevation is 4,200 to 5,000 feet. The average annual precipitation is 15 to 17 inches, the average annual air temperature is 45 to 49 degrees F., and the frost-free period is 105 to 130 days.

Taxonomic Class: Coarse-loamy, mixed, superactive, mesic Aridic Argiustolls

Typical pedon of Julesburg fine sandy loam, 0 to 6 percent slopes, about 1,300 feet east and 2,100 feet south of the northwest corner of section 16, T. 42 N., R. 70 W.

A—0 to 10 inches; brown (10YR 5/3) fine sandy loam, dark brown (10YR 3/3) moist; weak fine granular structure; soft, friable, nonsticky and nonplastic; many fine and very fine roots; neutral; clear wavy boundary.

Bt1—10 to 20 inches; yellowish brown (10YR 5/4) fine sandy loam, brown (10YR 4/3) moist; weak coarse prismatic structure parting to moderate coarse and medium subangular blocky; soft, friable, nonsticky and slightly plastic; common fine and very fine roots; many prominent clay films bridging sand grains, many faint clay films on faces of peds; neutral; clear wavy boundary.

Bt2—20 to 32 inches; light yellowish brown (10YR 6/4) fine sandy loam, brown (10YR 5/3) moist; weak coarse and medium subangular blocky structure; soft, friable, nonsticky and nonplastic; common fine and very fine roots; many distinct clay films bridging sand grains, common faint clay films on faces of peds; slightly alkaline; gradual wavy boundary.

C—32 to 60 inches; pale brown (10YR 6/3) fine sandy loam, brown (10YR 5/3) moist; massive; soft, friable, nonsticky and nonplastic; few fine and very fine roots; slightly alkaline.

The mollic epipedon is 10 to 16 inches thick. The soils are typically noneffervescent throughout, but may be slightly effervescent below 50 inches in some pedons.

The Bt and C horizon textures are fine sandy loam or sandy loam. Reaction is neutral or slightly alkaline.

Keeline Series

The Keeline series consists of very deep, well drained soils on ridges, hills, and stream terraces. The soils formed in alluvium or eolian deposits derived from sandstone. Slopes range from 0 to 20 percent. Elevation is 4,100 to 5,200 feet. The average annual precipitation is 10 to 16 inches, the average annual air temperature is 45 to 49 degrees F., and the frost-free period is 105 to 130 days.

Taxonomic Class: Coarse-loamy, mixed, superactive, calcareous, mesic Ustic Torriorthents

Typical pedon of Keeline fine sandy loam, in an area of Turnercrest-Keeline-Taluce fine sandy loams, 6 to 30 percent slopes, about 700 feet north and 2,000 feet east of the southwest corner of section 2, T. 43 N., R. 75 W.

A—0 to 4 inches; yellowish brown (10YR 5/4) fine sandy loam, brown (10YR 4/3) moist; weak fine angular blocky structure parting to weak fine and very fine granular; soft, very friable, nonsticky and nonplastic; many fine and very fine roots; strongly effervescent, calcium carbonate disseminated; moderately alkaline; gradual wavy boundary.

C1—4 to 10 inches; pale brown (10YR 6/3) fine sandy loam, brown (10YR 5/3) moist; massive; soft, very friable, nonsticky and nonplastic; common fine and very fine roots; violently effervescent; calcium carbonate disseminated; moderately alkaline; gradual wavy boundary.

C2—10 to 60 inches; very pale brown (10YR 7/3) fine sandy loam, brown (10YR 5/3) moist; massive; soft, very friable, nonsticky and nonplastic; few very fine roots; violently effervescent; calcium carbonate disseminated; strongly alkaline.

Depth to effervescent layers ranges from 0 to 6 inches.

The A horizon texture is loamy sand or sandy loam. Reaction is slightly alkaline or moderately alkaline.

The C horizon texture is sandy loam or fine sandy loam.

Keyner Series

The Keyner series consists of very deep, well drained soils on alluvial fans and fan remnants. The soils formed in alluvium derived from mixed sources. Slopes range from 0 to 6 percent. Elevation is 4,100 to 5,200 feet. The average annual precipitation is 10 to 14 inches, the average annual air temperature is 45 to 49 degrees F., and the frost-free period is 105 to 130 days.

Taxonomic Class: Fine-loamy, mixed, superactive, mesic Haplic Ustic Natrargids

Typical pedon of Keyner fine sandy loam, 0 to 6 percent slopes, about 200 feet east and 400 feet south of the northwest corner of section 35, T. 42 N., R. 71 W.

E—0 to 4 inches; pale brown (10YR 6/3) fine sandy loam, brown (10YR 5/3) moist; weak fine granular

structure; soft, friable, nonsticky and nonplastic; common medium and many fine and very fine roots; slightly alkaline; clear wavy boundary.

Bt—4 to 12 inches; pale brown (10YR 6/3) clay loam, brown (10YR 5/3) moist; moderate coarse columnar structure parting to moderate coarse angular blocky; hard, firm, slightly sticky and slightly plastic; few fine and very fine roots; common faint clay films on faces of peds; moderately alkaline; clear wavy boundary.

Btn—12 to 20 inches; pale brown (10YR 6/3) sandy clay loam, brown (10YR 5/3) moist; moderate medium subangular blocky structure; hard, firm, slightly sticky and slightly plastic; few fine and very fine roots; common faint clay films on faces of peds; common medium and fine filaments and masses of calcium sulfate; strongly alkaline; gradual wavy boundary.

Btkn—20 to 26 inches; pale brown (10YR 6/3) sandy clay loam, brown (10YR 5/3) moist; weak medium subangular blocky structure; hard, firm, slightly sticky and slightly plastic; few fine and very fine roots; common faint clay films on faces of peds; slightly effervescent; common medium and fine seams, filaments, and masses of calcium carbonate; few fine masses and medium crystals of calcium sulfate; very strongly alkaline; gradual wavy boundary.

Bkn1—26 to 48 inches; pale brown (10YR 6/3) sandy clay loam, brown (10YR 5/3) moist; massive; hard, firm, slightly sticky and slightly plastic; few fine roots; slightly effervescent; common medium and fine seams and masses of calcium carbonate; few fine masses and medium crystals of calcium sulfate; very strongly alkaline; gradual wavy boundary.

Bkn2—48 to 60 inches; pale brown (10YR 6/3) sandy clay loam, brown (10YR 5/3) moist; massive; hard, firm, slightly sticky and slightly plastic; slightly effervescent; few medium and fine seams and masses of calcium carbonate and calcium sulfate; strongly alkaline.

Depth to calcium carbonate accumulations ranges from 12 to 18 inches. Depth to the natric horizon ranges from 14 to 20 inches.

Reaction in the E horizon is slightly alkaline or moderately alkaline. Electrical conductivity ranges from 0 to 2 millimhos per centimeter. Sodium adsorption ratio ranges from 0 to 5.

The Bt, Btn, and Btkn horizon textures are sandy clay loam or clay loam. Electrical conductivity ranges from 0 to 2 millimhos per centimeter and sodium adsorption ratio ranges from 2 to 9 in the Bt horizon.

Reaction is strongly alkaline or very strongly alkaline and electrical conductivity ranges from 8 to 16 millimhos per centimeter in the Btn and Btkn horizons. Sodium adsorption ratio ranges from 10 to 20 in the Btn horizon and from 15 to 30 in the Btkn horizon.

The Bkn horizon texture is sandy loam, fine sandy loam, or sandy clay loam. Reaction is strongly alkaline or very strongly alkaline. Electrical conductivity ranges from 8 to 16 millimhos per centimeter. Sodium adsorption ratio ranges from 15 to 30.

Kishona Series

The Kishona series consists of very deep, well drained soils on alluvial fans, fan remnants, stream terraces, hills, and ridges. The soils formed in alluvium derived from mixed sources. Slopes range from 0 to 15 percent. Elevation is 4,100 to 5,200 feet. The average annual precipitation is 10 to 14 inches, the average annual air temperature is 45 to 49 degrees F., and the frost-free period is 105 to 130 days.

Taxonomic Class: Fine-loamy, mixed, superactive, calcareous, mesic Ustic Torriorthents

Typical pedon of Kishona loam, in an area of Theedle-Kishona loams, 6 to 20 percent slopes, about 1,500 feet west and 2,300 feet south of the northeast corner of section 27, T. 42 N., R. 76 W.

A—0 to 4 inches; pale brown (10YR 6/3) loam, brown (10YR 4/3) moist; weak medium and moderate fine granular structure; slightly hard, friable, sticky and slightly plastic; many fine and very fine roots; slightly effervescent; calcium carbonate disseminated; moderately alkaline; clear wavy boundary.

Bk1—4 to 15 inches; very pale brown (10YR 7/3) clay loam, brown (10YR 5/3) moist; weak coarse and medium subangular blocky structure; slightly hard, friable, sticky and slightly plastic; common fine and very fine roots; strongly effervescent; common medium and many fine rounded masses of calcium carbonate; strongly alkaline; clear wavy boundary.

Bk2—15 to 60 inches; very pale brown (10YR 7/3) clay loam, brown (10YR 5/3) moist; massive; slightly hard, friable, sticky and plastic; few fine

and very fine roots; strongly effervescent; few medium and common fine rounded masses of calcium carbonate; strongly alkaline.

Depth to accumulations of calcium carbonate ranges from 0 to 5 inches.

The A and Bk horizon textures are loam or clay loam. Reaction is slightly alkaline or moderately alkaline in the A horizon.

Lawver Series

The Lawver series consists of very deep, well drained soils on mesas and terraces. These soils formed in alluvium or eolian deposits over weathered porcelanite. Slopes range from 0 to 15 percent. Elevation is 4,200 to 5,200 feet. The average annual precipitation is 10 to 14 inches, the average annual air temperature is 45 to 49 degrees F., and the frost-free period is 105 to 130 days.

Taxonomic Class: Fine, smectitic, mesic Ustic Paleargids

Typical pedon of Lawver loam, in an area of Lawver-Teckla-Wibaux complex, 0 to 6 percent slopes, about 50 feet south and 1,900 feet east of the northwest corner of section 14, T. 43 N., R. 69 W.; 43 degrees 42 minutes 33 seconds north latitude and 105 degrees 6 minutes and 51 seconds west longitude.

E—0 to 4 inches; brown (10YR 5/3) loam, dark brown (10YR 3/3) moist; weak thick platy structure parting to weak fine and medium granular; soft, very friable, nonsticky and nonplastic; many very fine and fine roots throughout; 5 percent angular porcelanite channers; neutral; abrupt smooth boundary.

Bt1—4 to 10 inches; brown (10YR 5/3) clay loam, brown (10YR 4/3) moist; moderate medium prismatic structure parting to strong fine and medium subangular blocky; hard, friable, moderately sticky and moderately plastic; many very fine and fine roots throughout; few distinct discontinuous dark brown (10YR 3/3) clay films on faces of peds; 5 percent angular porcelanite channers; neutral; clear smooth boundary.

Bt2—10 to 20 inches; pale brown (10YR 6/3) clay, brown (10YR 5/3) moist; strong fine and medium prismatic structure parting to strong fine and medium angular blocky; hard, firm, moderately sticky and moderately plastic; many very fine and fine roots throughout; few distinct discontinuous dark brown (10YR 3/3) clay films on faces of peds; 8 percent angular porcelanite channers; neutral; clear wavy boundary.

Btk—20 to 27 inches; pinkish gray (7.5YR 6/2) channery clay loam, brown (7.5YR 5/4) moist; strong fine and medium angular blocky structure; hard, firm, moderately sticky and moderately plastic; many very fine and fine roots throughout; few distinct discontinuous dark brown (7.5YR 3/4) clay films on faces of peds; strongly effervescent; carbonates are disseminated throughout; 20 percent angular porcelanite channers; slightly alkaline; gradual wavy boundary.

Bk—27 to 38 inches; light brown (7.5YR 6/4) very channery clay loam, brown (7.5YR 5/4) moist; massive; slightly hard, friable, moderately sticky and moderately plastic; common very fine and fine roots throughout; strongly effervescent; carbonates are disseminated throughout; 40 percent angular porcelanite channers and 10 percent subrounded mixed cobbles; strongly alkaline; clear wavy boundary.

2C—38 to 60 inches; fractured porcelanite with 8 percent partly filled interstices of light reddish brown (2.5YR 6/4) sandy loam, reddish brown (2.5YR 4/4) moist; massive; soft, friable, nonsticky and nonplastic; common fine roots throughout; soil matrix is noneffervescent but thin coatings of carbonate occur on some rock fragments; 65 percent angular porcelanite channers, 20 percent subangular mixed flagstones, and 7 percent subrounded mixed stones; neutral.

Depth to accumulations of calcium carbonate ranges from 10 to 22 inches. Depth to strongly contrasting particle size ranges from 20 to 40 inches.

Reaction in the E horizon is neutral or slightly alkaline.

The Bt horizon texture is clay loam or clay. Rock fragments range from 0 to 15 percent porcelanite channers. Reaction is neutral or slightly alkaline.

The Btk horizon texture is channery clay loam or channery clay. Reaction is slightly alkaline or moderately alkaline. Rock fragments range from 15 to 30 percent porcelanite channers.

The Bk horizon texture is very channery clay loam or very channery loam. Rock fragments range from 35 to 60 percent porcelanite channers and 0 to 10 percent cobbles.

Reaction in the 2C horizon is slightly acid to slightly alkaline. Rock fragments range from 35 to 90

percent porcelanite fragments, of which 35 to 70 percent are channers, 10 to 20 percent flagstones, and 0 to 10 percent stones.

Leiter Series

The Leiter series consists of moderately deep, well drained soils on hills and ridges. The soils formed in residuum or alluvium over residuum derived primarily from shale. Slopes range from 0 to 15 percent. Elevation is 4,300 to 4,800 feet. The average annual precipitation is 15 to 17 inches, the average annual air temperature is 45 to 49 degrees F., and the frost-free period is 105 to 130 days.

Taxonomic Class: Fine, smectitic, mesic Aridic Haplustalfs

Typical pedon of Leiter clay loam, in an area of Moorhead-Leiter clay loams, 0 to 6 percent slopes; about 1,650 feet west and 1,900 feet north of the southeast corner of section 20, T. 50 N., R. 73 W.; USGS topographic quadrangle Oriva, WY; 44 degrees 18 minutes 21 seconds north latitude and 105 degrees 40 minutes 21 seconds west longitude.

A—0 to 3 inches; brown (10YR 5/3) clay loam, brown (10YR 4/3) moist; weak medium and strong fine granular structure; slightly hard, friable, sticky and plastic; many very fine and fine and few medium roots; neutral (pH 7.0); clear smooth boundary.

Bt1—3 to 8 inches; brown (10YR 5/3) clay loam, brown (10YR 4/3) moist; weak medium prismatic structure parting to strong medium and fine angular blocky; hard, firm, moderately sticky and moderately plastic; many very fine, common fine, and few medium roots throughout; few faint brown (10YR 4/3) clay films on faces of peds; neutral (pH 7.0); clear smooth boundary.

Bt2—8 to 17 inches; brown (10YR 5/3) clay, brown (10YR 4/3) moist; strong medium prismatic structure parting to strong medium angular blocky; very hard, very firm, very sticky and very plastic; common fine and very fine and few medium roots throughout; few faint dark brown (10YR 3/3) clay films on faces of peds; slightly alkaline (pH 7.4); clear wavy boundary.

Btk—17 to 22 inches; pale brown (10YR 6/3) clay, brown (10YR 5/3) moist; moderate medium prismatic structure parting to moderate medium subangular blocky; very hard, very firm, very sticky and very plastic; common fine and very fine and few medium roots throughout; few distinct dark brown (10YR 3/3) clay films on faces of peds; common fine irregular light gray (10YR 7/2) carbonate threads and fine rounded light gray (10YR 7/2) masses of carbonate throughout; strongly effervescent; moderately alkaline (pH 8.2); clear wavy boundary.

Bk—22 to 33 inches; pale brown (10YR 6/3) clay loam, brown (10YR 5/3) moist; weak medium and coarse subangular blocky structure; hard, firm, moderately sticky and moderately plastic; common very fine and fine roots throughout; common fine and medium irregular light gray (10YR 7/2) carbonate threads and fine rounded light gray (10YR 7/2) masses of carbonate throughout; strongly effervescent; moderately alkaline (pH 8.4); clear wavy boundary.

Cr—33 to 60 inches; brownish yellow to grayish brown soft shale; slightly effervescent to about 50 inches and inconsistently effervescent below.

Depth to accumulations of calcium carbonate ranges from 9 to 21 inches. Depth to bedrock ranges from 20 to 40 inches.

Reaction in the A horizon is neutral or slightly alkaline.

The Bt, Btk, and Bk horizon textures are clay loam or clay. Reaction in the Bt horizon is neutral or slightly alkaline.

Lismas Series

The Lismas series consists of shallow, well drained soils on ridges and hills. The soils formed in residuum derived from nonacid shale. Slopes range from 3 to 45 percent. Elevation is 4,100 to 4,800 feet. The average annual precipitation is 15 to 17 inches, the average annual air temperature is 45 to 48 degrees F., and the frost-free period is 105 to 130 days.

Taxonomic Class: Clayey, smectitic, nonacid, mesic, shallow Aridic Ustorthents

Typical pedon of Lismas clay loam, about 1,950 feet west and 1,500 feet south of the northeast corner of section 24, T. 56 N., R. 69 W.; USGS topographic quadrangle Bonnie Reservoir, WY; 44 degrees 49 minutes 33 seconds north latitude and 105 degrees 4 minutes 59 seconds west longitude.

A—0 to 3 inches; olive brown (2.5Y 4/3) clay loam, dark olive brown (2.5Y 3/3) moist; moderate fine and medium angular blocky structure parting to weak fine granular; slightly hard, friable, slightly sticky and moderately plastic; many very fine and fine and common medium roots throughout;

many very fine and fine pores; neutral; clear wavy boundary.

C—3 to 12 inches; olive brown (2.5Y 4/3) clay, dark olive brown (2.5Y 3/3) moist; strong medium and coarse angular blocky structure; hard, friable, very sticky and very plastic; many very fine and fine roots throughout; many very fine and fine pores; very slightly effervescent; inconsistently effervescent; neutral; clear wavy boundary.

Cy—12 to 16 inches; dark olive brown (2.5Y 3/3) and olive brown (2.5Y 4/3) clay; moderate fine and medium angular blocky structure; hard, friable, moderately sticky and moderately plastic; many very fine and fine roots throughout; common very fine and fine pores; few distinct discontinuous strong brown (7.5YR 5/6) iron stains on faces of peds; common fine irregular light gray (10YR 7/2) masses of gypsum throughout; 15 percent angular shale fragments that break down with pretreatment; slightly alkaline; clear wavy boundary.

Cr—16 to 60 inches; shale bedrock.

Depth to bedrock ranges from 6 to 20 inches.

Reaction in the A horizon is slightly acid to slightly alkaline. 0 to 15 percent fragments of selenite are scattered on the surface.

The C horizon texture is clay or silty clay. Reaction is moderately acid to slightly alkaline. Rock fragments range from 0 to 15 percent shale channers.

Maysdorf Series

The Maysdorf series consists of very deep, well drained soils on alluvial fans, fan remnants, hills, and ridges. The soils formed in alluvium and eolian deposits derived from mixed sources. Slopes range from 0 to 15 percent. Elevation is 4,100 to 5,100 feet. The average annual precipitation is 10 to 14 inches, the average annual air temperature is 45 to 49 degrees F., and the frost-free period is 105 to 130 days.

Taxonomic Class: Fine-loamy, mixed, superactive, mesic Ustic Calciargids

Typical pedon of Maysdorf fine sandy loam, 0 to 6 percent slopes, about 1,300 feet north and 2,450 feet west of the southeast corner of section 14, T. 46 N., R. 71 W.; 43 degrees 57 minutes 37 seconds north latitude and 105 degrees 21 minutes 7 seconds west longitude.

A—0 to 3 inches; pale brown (10YR 6/3) fine sandy loam, brown (10YR 4/3) moist; weak fine granular structure; soft, very friable, nonsticky and nonplastic; many very fine and fine roots throughout; neutral; clear smooth boundary.

BA—3 to 7 inches; light brown (7.5YR 6/4) fine sandy loam, brown (7.5YR 4/4) moist; weak medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; many fine and very fine roots throughout; few faint clay films on faces of peds; slightly alkaline; abrupt smooth boundary.

Bt1—7 to 19 inches; light reddish brown (5YR 6/4) sandy clay loam, reddish brown (5YR 5/4) moist; strong medium prismatic structure; hard, firm, sticky and plastic; many fine and very fine roots throughout; many distinct discontinuous clay films on faces of peds; slightly alkaline; abrupt smooth boundary.

Bt2—19 to 33 inches; pale brown (10YR 6/3) sandy clay loam, brown (10YR 4/3) moist; weak medium prismatic structure parting to moderate medium angular blocky; hard, firm, sticky and plastic; few fine and very fine roots throughout; common clay films on faces of peds; slightly alkaline; clear smooth boundary.

Bk—33 to 60 inches; pale brown (10YR 6/3) fine sandy loam, grayish brown (10YR 5/2) moist; massive; slightly hard, friable, nonsticky and nonplastic; few fine and very fine roots throughout; common fine seams and round masses of calcium carbonate; violently effervescent; moderately alkaline.

Depth to accumulations of calcium carbonate ranges from 17 to 33 inches.

The A horizon texture is sandy loam, fine sandy loam, or sandy clay loam.

Reaction in the Bt horizon is neutral or slightly alkaline.

The Bk horizon texture is sandy loam or fine sandy loam. Reaction is slightly alkaline or moderately alkaline.

Mittenbutte Series

The Mittenbutte series consists of shallow, well drained soils on hills and ridges. The soils formed in residuum derived from interbedded sandstone and shale. Slopes range from 6 to 40 percent. Elevation is 4,100 to 4,800 feet. The average annual precipitation is 15 to 17 inches, the average annual air temperature is 45 to 49 degrees F., and the frost-free period is 105 to 130 days.

Taxonomic Class: Loamy, mixed, superactive, calcareous, mesic, shallow Aridic Ustorthents

Typical pedon of Mittenbutte fine sandy loam, about 1,200 feet east and 350 feet north of the southwest corner of section 22, T. 57 N., R. 73 W.; USGS topographic quadrangle Corral Creek, WY; 44 degrees 54 minutes 13 seconds north latitude and 105 degrees 37 minutes 44 seconds west longitude.

A—0 to 3 inches; pale brown (10YR 6/3) fine sandy loam, brown (10YR 4/3) moist; weak fine granular structure; loose, very friable, nonsticky and nonplastic; strongly effervescent; 1 percent angular sandstone gravel; slightly alkaline; gradual smooth boundary.

AC—3 to 9 inches; brown (10YR 5/3) fine sandy loam, brown (10YR 4/3) moist; weak fine subangular blocky structure parting to weak fine granular; loose, very friable, nonsticky and nonplastic; strongly effervescent; about 1 percent angular sandstone gravel; moderately alkaline; clear smooth boundary.

C—9 to 16 inches; light yellowish brown (2.5Y 6/3) fine sandy loam, light olive brown (2.5Y 5/3) moist; massive; loose, very friable, nonsticky and nonplastic; strongly effervescent; 1 percent angular sandstone gravel; moderately alkaline; clear wavy boundary.

Cr—16 to 60 inches; light yellowish brown (2.5Y 6/3) soft calcareous sandstone, light olive brown (2.5Y 5/3) moist.

Depth to bedrock ranges from 10 to 20 inches. Depth to calcium carbonate ranges from 0 to 6 inches.

Reaction in the A horizon is slightly alkaline or moderately alkaline.

The C horizon texture is fine sandy loam or sandy loam. Reaction is moderately alkaline or strongly alkaline.

Note: The Mittenbutte soil in map unit 162 is a taxadjunct to the Mittenbutte series. The soil in this map unit is slightly acid or neutral throughout and is noneffervescent. This soil is classified as loamy, mixed, superactive, nonacid, mesic, shallow Aridic Ustorthents.

Moorhead Series

The Moorhead series consists of very deep, well drained soils on alluvial fans, fan remnants, hills, and ridges. The soils formed in alluvium derived primarily from shale. Slopes range from 0 to 15 percent. Elevation is 4,300 to 4,800 feet. The average annual precipitation is 15 to 17 inches, the average annual air temperature is 45 to 49 degrees F., and the frost-free period is 105 to 130 days.

Taxonomic Class: Fine, smectitic, mesic Aridic Haplustalfs

Typical pedon of Moorhead clay loam, 0 to 6 percent slopes, about 2,450 feet east and 1,450 feet north of the southwest corner of section 36, T. 55 N., R. 69 W.; USGS topographic quadrangle Brislawn School, WY; 44 degrees 42 minutes 13 seconds north latitude and 105 degrees 5 minutes 44 seconds west longitude.

A—0 to 4 inches; brown (10YR 5/3) clay loam, brown (10YR 4/3) moist; weak medium subangular blocky structure parting to weak fine granular; slightly hard, friable, moderately sticky and moderately plastic; many very fine and fine roots throughout; many fine vesicular pores throughout; neutral (pH 7.4); clear smooth boundary.

Bt—4 to 18 inches; brown (10YR 4/3) clay, dark brown (10YR 3/3) moist; strong medium and coarse prismatic structure parting to moderate fine and medium angular blocky; very hard, firm, very sticky and very plastic; common fine and few medium roots throughout; many fine irregular pores throughout; many distinct continuous very dark grayish brown (10YR 3/2) clay films on faces of peds; slightly alkaline (pH 7.6); clear wavy boundary.

Btk—18 to 24 inches; brown (10YR 5/3) clay, brown (10YR 4/3) moist; strong medium and coarse prismatic structure parting to moderate fine and medium angular blocky; very hard, firm, very sticky and very plastic; common very fine and fine roots throughout; many fine irregular pores throughout; common distinct discontinuous dark brown (10YR 3/3) clay films on faces of peds; common fine irregular light gray (10YR 7/2) carbonate threads throughout; strongly effervescent; moderately alkaline (pH 8.0); gradual wavy boundary.

Bk1—24 to 32 inches; light olive brown (2.5Y 5/3) clay, olive brown (2.5Y 4/3) moist; strong medium and coarse prismatic structure parting to moderate fine and medium angular blocky; hard, firm, very sticky and very plastic; common very fine and fine roots throughout; common fine irregular pores throughout; common fine irregular light gray (10YR 7/2) carbonate threads throughout; violently effervescent; moderately alkaline (pH 8.2); gradual wavy boundary.

Bk2—32 to 60 inches; light yellowish brown (2.5Y 6/3) clay loam, olive brown (2.5Y 4/3) moist;

moderate fine and medium angular blocky structure; hard, friable, moderately sticky and moderately plastic; common fine irregular pores throughout; common fine irregular light gray (10YR 7/2) carbonate threads throughout; strongly effervescent; strongly alkaline (pH 8.4).

Depth to accumulations of calcium carbonate ranges from 13 to 29 inches.

The A horizon texture is clay loam or loam.

The Bt, Btk, and Bk horizon textures are clay or clay loam. Reaction is neutral or slightly alkaline in the Bt horizon.

Moskee Series

The Moskee series consists of very deep, well drained soils on alluvial fans, fan remnants, hills, and ridges. The soils formed in alluvium and eolian deposits derived from mixed sources. Slopes range from 0 to 10 percent. Elevation is 4,100 to 5,000 feet. The average annual precipitation is 15 to 17 inches, the average annual air temperature is 45 to 49 degrees F., and the frost-free period is 105 to 130 days.

Taxonomic Class: Fine-loamy, mixed, superactive, mesic Aridic Argiustolls

Typical pedon of Moskee fine sandy loam, 0 to 6 percent slopes, about 2,400 feet north and 1,100 feet east of the southwest corner of section 12, T. 54 N., R. 74 W.; USGS topographic quadrangle Recluse, WY; 44 degrees 40 minutes 34 seconds north latitude and 105 degrees 42 minutes 42 seconds west longitude.

A1—0 to 6 inches; brown (10YR 5/3) fine sandy loam, very dark brown (10YR 2/2) moist; weak fine granular structure; slightly hard, very friable, nonsticky and nonplastic; many very fine and fine roots throughout; common fine pores; neutral; clear smooth boundary.

A2—6 to 9 inches; brown (10YR 5/3) fine sandy loam, very dark brown (10YR 2/2) moist; weak fine granular structure; slightly hard, very friable, nonsticky and nonplastic; many very fine and fine roots throughout; many fine pores; neutral; clear wavy boundary.

Bt—9 to 24 inches; dark yellowish brown (10YR 4/4) sandy clay loam, dark yellowish brown (10YR 3/4) moist; moderate medium prismatic structure parting to moderate fine and medium angular blocky; hard, friable, slightly sticky and slightly plastic; common very fine and fine roots throughout; many fine pores; common distinct discontinuous dark brown (10YR 3/3) clay films on faces of peds; neutral; gradual wavy boundary.

Btk—24 to 32 inches; brown (10YR 5/3) sandy clay loam, brown (10YR 4/3) moist; moderate medium prismatic structure parting to moderate fine and medium angular blocky; hard, friable, slightly sticky and slightly plastic; common very fine and fine roots throughout; common fine pores; few distinct discontinuous dark brown (10YR 3/3) clay films on faces of peds; common fine irregular light gray (10YR 7/2) carbonate threads throughout; slightly effervescent; slightly alkaline; clear wavy boundary.

Bk—32 to 60 inches; brown (10YR 5/3) fine sandy loam, brown (10YR 4/3) moist; moderate fine and medium angular blocky structure; loose, very friable, nonsticky and nonplastic; common very fine and fine roots throughout; many fine pores; common fine irregular light gray (10YR 7/2) carbonate threads throughout; strongly effervescent; moderately alkaline.

The mollic epipedon is 7 to 20 inches thick and commonly includes part of the argillic horizon. Depth to calcium carbonate accumulations ranges from 10 to 35 inches.

The Bt horizon texture is sandy clay loam, very fine sandy loam, or fine sandy loam. Reaction is neutral or slightly alkaline.

The Bk horizon texture is fine sandy loam or sandy loam.

Muleherder Series

The Muleherder series consists of very deep, well drained soils on hills and ridges. The soils formed in colluvium and alluvium derived from porcelanite. Slopes range from 3 to 60 percent. Elevation is 4,100 to 4,800 feet. The average annual precipitation is 15 to 17 inches, the average annual temperature is 45 to 49 degrees F., and the frost-free period is 105 to 130 days.

Taxonomic Class: Loamy-skeletal over fragmental, mixed, superactive, mesic Aridic Haplustepts

Typical pedon of Muleherder channery loam, in an area of Muleherder-Ironbutte channery loams, 3 to 40 percent slopes, about 200 feet west and 900 feet south of the northeast corner of section 7, T. 57 N., R. 73 W.; USGS topographic quadrangle Corral Creek, WY; 44 degrees 56 minutes 36 seconds north

latitude and 105 degrees 40 minutes 31 seconds west longitude.

A—0 to 2 inches; reddish brown (5YR 4/3) channery loam, dark reddish brown (5YR 3/3) moist; weak fine granular structure; slightly hard, friable, nonsticky and nonplastic; 5 percent angular porcelanite channers; neutral; clear smooth boundary.

Bw1—2 to 12 inches; reddish brown (5YR 4/4) channery loam, dark reddish brown (5YR 3/4) moist; weak fine and medium subangular blocky structure; slightly hard, friable, nonsticky and nonplastic; 15 percent angular porcelanite channers; neutral; clear smooth boundary.

Bw2—12 to 16 inches; red (2.5YR 5/6) channery loam, red (2.5YR 4/6) moist; weak fine subangular blocky structure; slightly hard, friable, nonsticky and nonplastic; 20 percent angular porcelanite channers; neutral; clear wavy boundary.

BCk1—16 to 28 inches; light reddish brown (5YR 6/4) very channery fine sandy loam, reddish brown (5YR 5/4) moist; massive; loose, nonsticky and nonplastic; few distinct discontinuous light gray (10YR 7/2) carbonate coats on rock fragments; strongly effervescent; 40 percent angular porcelanite channers; moderately alkaline; clear wavy boundary.

BCk2—28 to 33 inches; red (2.5YR 5/6) extremely channery fine sandy loam, red (2.5YR 4/6) moist; massive; loose, nonsticky and nonplastic; few distinct discontinuous light gray (10YR 7/2) carbonate coats on rock fragments; strongly effervescent; 65 percent angular porcelanite channers; moderately alkaline; clear wavy boundary.

2C—33 to 60 inches; fractured porcelanite.

Depth to the fragmental substrata ranges from 20 to 40 inches. Depth to calcium carbonate accumulations ranges from 0 to 24 inches. The fragmental materials in some pedons are inconsistently calcareous.

Rock fragments range from 0 to 40 percent in the A horizon, with 0 to 5 percent flagstones and stones.

The Bw horizon texture is channery loam or very channery loam. Reaction is neutral to moderately alkaline. Rock fragments range from 15 to 90 percent, with 0 to 5 percent stones and 0 to 15 percent flagstones.

The BCk horizon texture is very channery or extremely channery fine sandy loam. Reaction is neutral to moderately alkaline. Rock fragments range from 15 to 90 percent, with 0 to 5 percent stones and 0 to 15 percent flagstones.

The 2C horizon consists of fractured porcelanite material. A soil matrix is uncommon, but when present is less than 5 percent. Flagstones make up from 15 to 45 percent and channers 50 to 85 percent of this horizon.

Niobrara Series

The Niobrara series consists of shallow, excessively drained soils on ridges and hills. The soils formed in residuum and wind reworked material derived from sandstone. Slopes range from 3 to 30 percent. Elevation is 4,100 to 5,200 feet. The average annual precipitation is 10 to 16 inches, the average annual air temperature is 45 to 49 degrees F., and the frost-free period is 105 to 130 days.

Taxonomic Class: Mixed, mesic, shallow Aridic Ustipsamments

Typical pedon of Niobrara loamy sand, in an area of Keeline-Tullock-Niobrara, dry complex, 3 to 30 percent slopes, about 2,200 feet east and 2,220 feet south of the northwest corner of section 7, T. 42 N., R. 75 W.

A—0 to 3 inches; pale brown (10YR 6/3) loamy sand, brown (10YR 4/3) moist; single grain; loose, friable, nonsticky and nonplastic; many fine and very fine roots; slightly effervescent; calcium carbonate disseminated; slightly alkaline; clear wavy boundary.

C—3 to 12 inches; light yellowish brown (10YR 6/4) sand, yellowish brown (10YR 5/4) moist; massive structure parting to single grain; loose, friable, nonsticky and nonplastic; common fine and very fine roots; neutral; clear wavy boundary.

Cr—12 to 60 inches; slightly hard, coarse sandstone.

Depth to bedrock ranges from 10 to 20 inches. The soils can be noneffervescent throughout, but commonly are slightly effervescent in the surface layer where deposition of fine earth material containing calcium carbonate has occurred. Rock fragments range from 0 to 10 percent hard angular gravel.

Reaction in the A horizon is slightly acid to slightly alkaline.

The C horizon texture is sand and loamy sand. Reaction is neutral or slightly alkaline.

Nuncho Series

The Nuncho series consists of very deep, well drained soils on alluvial fans and fan remnants. The soils formed in alluvium derived from mixed sources. Slopes range from 0 to 6 percent. Elevation is 4,300 to 5,200 feet. The average annual precipitation is 15 to 17 inches, the average annual air temperature is 45 to 49 degrees F., and the frost-free period is 105 to 130 days.

Taxonomic Class: Fine, smectitic, mesic Aridic Argiustolls

Typical pedon of Nuncho loam, 0 to 6 percent slopes, about 750 feet west and 1,300 feet north of the southeast corner of section 12, T. 49 N., R. 73 W.; USGS topographic quadrangle Apple Butte, WY; 44 degrees 14 minutes 5 seconds north latitude and 105 degrees 34 minutes 22 seconds west longitude.

A1—0 to 7 inches; grayish brown (10YR 5/2) loam, dark brown (10YR 3/3) moist; weak medium granular structure parting to moderate fine subangular blocky; soft, friable, slightly sticky and slightly plastic; neutral; clear smooth boundary.

A2—7 to 12 inches; grayish brown (10YR 5/2) loam, dark brown (10YR 3/3) moist; moderate medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; neutral; clear smooth boundary.

Bt1—12 to 18 inches; brown (10YR 5/3) clay loam, brown (10YR 4/3) moist; strong medium prismatic structure parting to strong fine and medium angular blocky; hard, friable, moderately sticky and moderately plastic; few distinct discontinuous dark brown (10YR 3/3) clay films on faces of peds; neutral; clear wavy boundary.

Bt2—18 to 30 inches; pale brown (10YR 6/3) clay, brown (10YR 4/3) moist; strong medium prismatic structure parting to strong medium angular blocky; very hard, firm, very sticky and very plastic; few distinct discontinuous dark brown (10YR 3/3) clay films on faces of peds; neutral; clear wavy boundary.

Bk—30 to 60 inches; pale brown (10YR 6/3) clay loam, brown (10YR 5/3) moist; weak fine and medium angular blocky structure; hard, friable, moderately sticky and moderately plastic; common fine irregular light gray (10YR 7/2) carbonate threads throughout; strongly effervescent; moderately alkaline.

The mollic epipedon is 8 to 15 inches thick. Depth to calcium carbonate accumulations ranges from 14 to 34 inches.

The Bt horizon texture is clay loam or clay. Reaction is neutral or slightly alkaline.

Oldwolf Series

The Oldwolf series consists of moderately deep, well drained soils on hills and ridges. The soils formed in alluvium over residuum derived from mixed sedimentary sources. Slopes range from 0 to 15 percent. Elevation is 4,300 to 4,800 feet. The average annual precipitation is 15 to 17 inches, the average annual air temperature is 45 to 49 degrees F., and the frost-free period is 105 to 130 days.

Taxonomic Class: Fine-loamy, mixed, superactive, mesic Aridic Haplustalfs

Typical pedon of Oldwolf loam, in an area of Deekay-Oldwolf loams, 0 to 6 percent slopes, about 100 feet east and 2,300 feet south of the northwest corner of section 16, T. 48 N., R. 71 W.; 44 degrees 8 minutes 20 seconds north latitude and 105 degrees 24 minutes 11 seconds west longitude.

A—0 to 5 inches; brown (10YR 5/3) loam, dark brown (10YR 3/3) moist; weak medium and moderate fine granular structure; soft, friable, slightly sticky and slightly plastic; many fine and very fine and few medium roots; neutral (pH 6.8); clear smooth boundary.

Bt—5 to 14 inches; yellowish brown (10YR 5/4) clay loam, dark yellowish brown (10YR 4/4) moist; moderate medium prismatic structure parting to moderate medium and fine angular blocky; hard, friable, sticky and plastic; common fine and very fine and few medium roots; many distinct clay films on faces of peds; slightly alkaline (pH 7.4); clear smooth boundary.

Btk—14 to 21 inches; pale brown (10YR 6/3) clay loam, brown (10YR 5/3) moist; weak medium and fine prismatic structure parting to moderate medium and fine subangular blocky; slightly hard, friable, slightly sticky and plastic; few fine and very fine roots; common faint clay films on faces of peds and lining pores; strongly effervescent; calcium carbonate mostly disseminated; slightly alkaline (pH 7.8); clear wavy boundary.

Bk—21 to 35 inches; pale brown (10YR 6/3) loam, brown (10YR 5/3) moist; weak medium and fine subangular blocky structure; slightly hard, friable,

slightly sticky and slightly plastic; few fine and very fine roots; strongly effervescent; common fine filaments and masses and few medium masses of calcium carbonate; moderately alkaline (pH 8.2); clear wavy boundary.

Cr—35 to 60 inches; yellowish brown (10YR 5/4) to light gray (10YR 7/2) silty shale.

Depth to calcium carbonate accumulations ranges from 14 to 32 inches. Depth to bedrock ranges from 20 to 40 inches.

The Bt, Btk, and Bk horizon textures are clay loam or loam. Reaction is neutral or slightly alkaline in the Bt horizon and slightly alkaline or moderately alkaline in the Btk horizon.

Orpha Series

The Orpha series consists of very deep, excessively drained soils on upland dunes. The soils formed in eolian deposits derived from sandstone. Slopes range from 3 to 30 percent. Elevation is 4,100 to 5,200 feet. The average annual precipitation is 10 to 14 inches, the average annual air temperature is 45 to 49 degrees F., and the frost-free period is 105 to 130 days.

Taxonomic Class: Mixed, mesic Ustic Torripsamments

Typical pedon of Orpha fine sand, in an area of Embry-Orpha complex, 3 to 15 percent slopes, about 200 feet west and 300 feet north of the southeast corner of section 34, T. 43 N., R. 72 W.

A—0 to 4 inches; brown (10YR 5/3) fine sand, dark brown (10YR 4/3) moist; single grain; loose, nonsticky and nonplastic; few medium and common fine roots; neutral; gradual smooth boundary.

C—4 to 60 inches; brownish yellow (10YR 6/6) fine sand, dark yellowish brown (10YR 4/4) moist; single grain; loose, nonsticky and nonplastic; few fine roots; neutral.

The soils are typically noneffervescent throughout, but some pedons may be slightly effervescent between 40 and 60 inches.

The A and C horizon textures are fine sand or loamy sand. Reaction is neutral or slightly alkaline.

Oshoto Series

The Oshoto series consists of very deep, well drained soils on alluvial fans and fan remnants. The soils formed in alluvium derived from mixed sources. Slopes range from 0 to 6 percent. Elevation is 4,300 to 4,800 feet. The average annual precipitation is 15 to 17 inches, the average annual air temperature is 45 to 49 degrees F., and the frost-free period is 105 to 130 days.

Taxonomic Class: Fine-silty, mixed, superactive, mesic Aridic Haplustalfs

Typical pedon of Oshoto silt loam, about 1,300 feet west and 600 feet south of the northeast corner section 34, T. 56 N., R. 75 W.; USGS topographic quadrangle Reservoir Creek, WY; 44 degrees 47 minutes 37 seconds north latitude and 105 degrees 52 minutes 5 seconds west longitude.

A—0 to 7 inches; brown (10YR 5/3) silt loam, brown (10YR 4/3) moist; weak fine and medium subangular blocky structure; loose, friable, nonsticky and nonplastic; neutral; abrupt smooth boundary.

Bt1—7 to 14 inches; brown (10YR 5/3) silty clay loam, brown (10YR 4/3) moist; moderate medium prismatic structure parting to moderate fine and medium subangular blocky; slightly hard, friable, moderately sticky and moderately plastic; few distinct discontinuous dark brown (10YR 3/3) clay films on faces of peds and in pores; neutral; clear wavy boundary.

Bt2—14 to 22 inches; brown (10YR 5/3) silty clay loam, brown (10YR 4/3) moist; moderate medium prismatic structure parting to moderate fine and medium subangular blocky; slightly hard, friable, moderately sticky and moderately plastic; few distinct discontinuous dark brown (10YR 3/3) clay films on faces of peds and in pores; slightly alkaline; gradual wavy boundary.

Btk—22 to 32 inches; light yellowish brown (2.5Y 6/3) silty clay loam, light olive brown (2.5Y 5/3) moist; moderate medium and coarse subangular blocky structure; slightly hard, friable, moderately sticky and moderately plastic; few distinct discontinuous olive brown (2.5Y 4/3) clay films on faces of peds and in pores; common fine irregular light gray (10YR 7/2) carbonate threads throughout; strongly effervescent; moderately alkaline; gradual wavy boundary

Bk1—32 to 43 inches; light yellowish brown (2.5Y 6/3) silty clay loam, light olive brown (2.5Y 5/3) moist; moderate medium and coarse subangular blocky structure; slightly hard, friable, moderately sticky and moderately plastic; common fine irregular light gray (10YR 7/2) carbonate threads throughout; violently effervescent; strongly alkaline; gradual wavy boundary.

Bk2—43 to 60 inches; light yellowish brown (2.5Y 6/3) silt loam, light olive brown (2.5Y 5/3) moist; moderate medium and coarse angular blocky structure; loose, very friable, nonsticky and nonplastic; common fine irregular light gray (10YR 7/2) carbonate threads throughout; violently effervescent; strongly alkaline.

Depth to continuous accumulations of calcium carbonate ranges from 10 to 27 inches.

Some pedons have an E horizon with characteristics similar to those of the A horizon.

The Bt and Btk horizon textures are silty clay loam or clay loam. Reaction is neutral or slightly alkaline in the Bt horizon.

The Bk horizon texture is silty clay loam, silt loam, or loam. Reaction is slightly alkaline or moderately alkaline.

Parmleed Series

The Parmleed series consists of moderately deep, well drained soils on hills and ridges. The soils formed in residuum or alluvium over residuum derived from shale, or interbedded shale and sandstone. Slopes range from 0 to 15 percent. Elevation is 4,100 to 5,200 feet. The average annual precipitation is 10 to 14 inches, the average annual air temperature is 45 to 49 degrees F., and the frost-free period is 105 to 130 days.

Taxonomic Class: Fine, smectitic, mesic Ustic Paleargids

Typical pedon of Parmleed loam, in an area of Parmleed-Renohill complex, 3 to 15 percent slopes, about 500 feet north and 1,600 feet west of the southeast corner of section 4, T. 45 N., R. 69 W. (fig. 4).

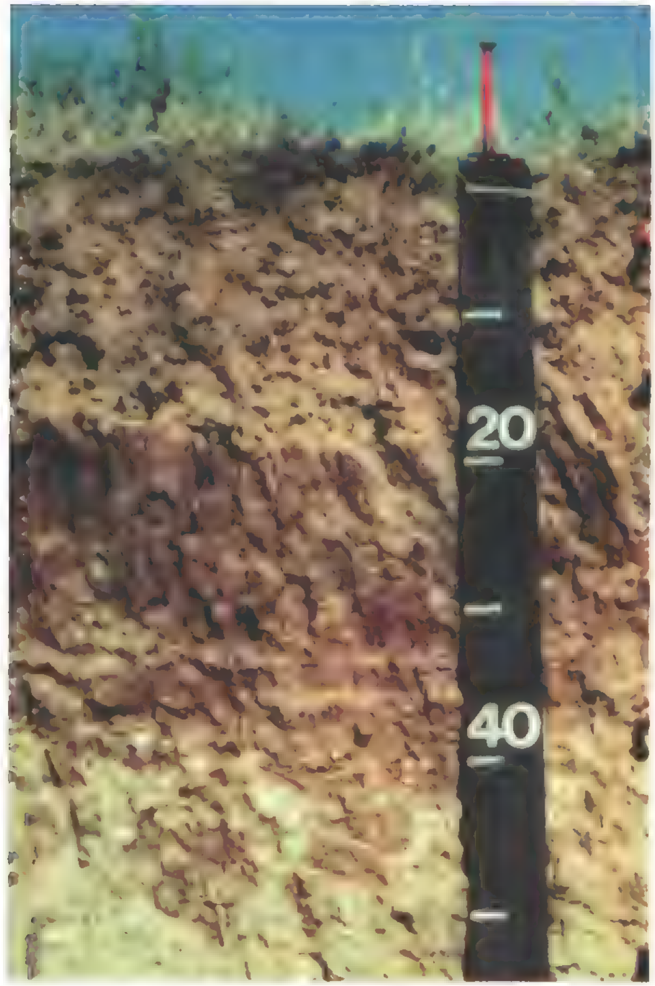

Figure 4. Typical pedon of the Parmleed series. This is a moderately deep, fine textured soil with shale occurring at a depth of about 27 inches.

E—0 to 3 inches; pale brown (10YR 6/3) loam, dark yellowish brown (10YR 4/4) moist; weak fine and moderate very fine granular structure; soft, friable, nonsticky and nonplastic; few medium and many fine and very fine roots; neutral; abrupt smooth boundary.

Bt1—3 to 6 inches; pale brown (10YR 6/3) clay loam, dark yellowish brown (10YR 4/4) moist; weak medium prismatic structure parting to moderate medium and fine platy; slightly hard, friable, slightly sticky and slightly plastic; few medium and many fine and very fine roots; neutral; abrupt smooth boundary.

Bt2—6 to 15 inches; yellowish brown (10YR 5/4) clay, dark yellowish brown (10YR 4/4) moist; strong medium prismatic structure parting to strong medium angular blocky; extremely hard, very firm, very sticky and very plastic; few medium and common fine and very fine roots; many prominent clay films on faces of peds; slightly alkaline; clear wavy boundary.

Btk—15 to 21 inches; light yellowish brown (10YR 6/4) clay, yellowish brown (10YR 5/4) moist; strong medium prismatic structure parting to strong medium angular blocky; extremely hard, very firm, very sticky and very plastic; few fine roots; many distinct and common prominent clay films on faces of peds; strongly effervescent; many medium and fine masses of calcium carbonate; moderately alkaline; clear wavy boundary.

Bk—21 to 27 inches; light gray (2.5Y 7/2) clay loam, light brownish gray (2.5Y 6/2) moist; weak medium subangular blocky structure; hard, firm, very sticky and plastic; few fine roots; strongly

effervescent; many fine seams and masses of calcium carbonate; strongly alkaline; gradual wavy boundary.

Cr—27 to 60 inches; soft effervescent sandy and silty shale.

Depth to bedrock ranges from 20 to 40 inches. Depth to accumulations of calcium carbonate ranges from 10 to 20 inches.

The Bt, Btk, and Bk horizon textures are clay or clay loam. Reaction is neutral or slightly alkaline in the Bt horizon.

Pitchdraw Series

The Pitchdraw series consists of moderately deep, well drained soils formed in alluvium or eolian deposits over residuum derived from soft sandstone. They are on hills and ridges. Slopes range from 2 to 30 percent. Elevation is 4,300 to 5,200 feet. The average annual precipitation is about 15 inches, the mean annual temperature is 45 to 50 degrees F., and the frost free period is 105 to 130 days.

Taxonomic Class: Coarse-loamy, mixed, superactive, calcareous, mesic Aridic Ustorthents

Typical pedon of Pitchdraw fine sandy loam, about 600 feet west and 2,500 feet north of the southeast corner of section 28, T. 55 N. R. 73 W.; USGS topographic quadrangle Recluse, WY; 44 degrees, 52 minutes, 54 seconds north latitude and 105 degrees, 38 minutes, 28 seconds west longitude.

A—0 to 4 inches; brown (10YR 5/3) fine sandy loam, dark brown (10YR 3/3) moist; weak fine granular structure; soft, very friable; many fine and very fine roots; few fine pores; carbonates are disseminated throughout; slightly effervescent; slightly alkaline (pH 7.6); clear smooth boundary.

Bk1—4 to 9 inches; brown (10YR 5/3) fine sandy loam, brown (10YR 4/3) moist; weak fine and medium subangular blocky structure; soft, very friable; common fine and very fine roots; few fine pores; strongly effervescent; carbonates disseminated throughout; moderately alkaline (pH 8.0); gradual wavy boundary.

Bk2—9 to 31 inches; brown (10YR 5/3) fine sandy loam, brown (10YR 4/3) moist; massive; soft, very friable; few fine roots throughout; few fine pores; strong effervescence; few fine irregular light gray (10YR 7/2) carbonate threads throughout; carbonates disseminated throughout; moderately alkaline (pH 8.2); clear wavy boundary.

Cr—31 to 60 inches; soft, light gray and very pale brown, calcareous sandstone.

Depth to paralithic contact or bedrock ranges from 20 to 40 inches. Depth to calcium carbonate accumulations ranges from 0 to 6 inches.

Reaction in the A horizon is neutral to moderately alkaline.

The Bk horizon texture is fine sandy loam or sandy loam.

Platmak Series

The Platmak series consists of very deep, well drained soils on alluvial fans and fan remnants. The soils formed in alluvium derived from shale. Slopes range from 0 to 6 percent. Elevation is 4,100 to 5,100 feet. The average annual precipitation is 14 to 17 inches, the average annual air temperature is 45 to 49 degrees F., and the frost-free period is 105 to 130 days.

Taxonomic Class: Fine, smectitic, mesic Aridic Paleustolls

Typical pedon of Platmak loam, 0 to 6 percent slopes, about 1,050 feet west and 925 feet north of the southeast corner of section 34, T. 51 N., R. 73 W.; USGS topographic quadrangle Gillette West, WY; 44 degrees 21 minutes 1 second north latitude and 105 degrees 36 minutes 52 seconds west longitude.

E—0 to 4 inches; grayish brown (10YR 5/2) loam, dark brown (10YR 3/3) moist; strong thin platy structure parting to strong very fine granular; soft, very friable, slightly sticky and nonplastic; many very fine and fine and common medium roots throughout; neutral; abrupt smooth boundary.

Bt1—4 to 12 inches; dark grayish brown (10YR 4/2) clay, very dark grayish brown (10YR 3/2) moist; strong medium prismatic structure parting to strong fine and medium angular blocky; hard, firm, very sticky and very plastic; many very fine and fine and common medium roots throughout; few distinct discontinuous black (10YR 2/1) clay films on faces of peds and in pores; neutral; clear smooth boundary.

Bt2—12 to 18 inches; brown (10YR 5/3) clay, brown (10YR 4/3) moist; strong medium and coarse prismatic structure parting to strong medium and coarse angular blocky; hard, firm, very sticky and very plastic; many very fine and fine and common medium roots throughout; few distinct

discontinuous very dark grayish brown (10YR 3/2) clay films on faces of peds and in pores; slightly alkaline; clear wavy boundary.

Btk—18 to 27 inches; pale brown (10YR 6/3) clay loam, brown (10YR 5/3) moist; weak medium prismatic structure parting to moderate fine and medium subangular blocky; hard, friable, very sticky and moderately plastic; common very fine to medium roots throughout; few distinct discontinuous dark brown (10YR 3/3) clay films on faces of peds and in pores; common fine irregular light gray (10YR 7/2) carbonate threads throughout; strongly effervescent; moderately alkaline; clear wavy boundary.

Bk1—27 to 40 inches; pale brown (10YR 6/3) clay loam, brown (10YR 5/3) moist; weak medium subangular blocky structure; hard, friable, moderately sticky and moderately plastic; common fine and medium roots throughout; common fine irregular light gray (10YR 7/2) carbonate threads throughout; strongly effervescent; moderately alkaline; clear wavy boundary.

Bk2—40 to 60 inches; pale brown (10YR 6/3) clay loam, brown (10YR 4/3) moist; massive; hard, friable, moderately sticky and moderately plastic; common fine roots throughout; common fine irregular light gray (10YR 7/2) carbonate threads throughout; strongly effervescent; moderately alkaline.

The mollic epipedon ranges from 7 to 19 inches thick. Depth to continuous accumulations of calcium carbonate ranges from 13 to 30 inches.

The Bt and Btk horizon textures are clay or clay loam. Reaction is neutral to slightly alkaline in the Bt horizon.

Pugsley Series

The Pugsley series consists of moderately deep, well drained soils on hills and ridges. The soils formed in eolian deposits and residuum derived from sandstone. Slopes range from 0 to 15 percent. Elevation is 4,100 to 5,200 feet. The average annual precipitation is 10 to 14 inches, the average annual air temperature is 45 to 49 degrees F., and the frost-free period is 105 to 130 days.

Taxonomic Class: Fine-loamy, mixed, superactive, mesic Ustic Haplargids

Typical pedon of Pugsley sandy loam, in an area of Maysdorf-Pugsley sandy loams, 0 to 6 percent slopes, about 70 feet east and 720 feet south of the northwest corner of section 8, T. 42 N., R. 70 W.

A—0 to 4 inches; brown (10YR 5/3) sandy loam, dark brown (10YR 3/3) moist; weak medium granular structure; soft, very friable, nonsticky and nonplastic; many fine and few very fine roots; neutral; clear smooth boundary.

Bt—4 to 15 inches; brown (7.5YR 5/4) sandy clay loam, dark brown (7.5YR 3/4) moist; moderate coarse prismatic structure parting to moderate coarse subangular blocky; hard, friable, slightly sticky and plastic; common fine and few very fine roots; common faint clay films on faces of peds; neutral; clear smooth boundary.

C—15 to 23 inches; yellowish brown (10YR 5/4) sandy loam, dark yellowish brown (10YR 4/4) moist; weak coarse subangular blocky structure; slightly hard, very friable, nonsticky and nonplastic; common fine and few very fine roots; slightly alkaline; clear wavy boundary.

Cr—23 to 60 inches; soft sandstone.

Depth to bedrock is 20 to 40 inches. The soils are typically noneffervescent throughout but may be inconsistently effervescent 1 to 3 inches above the bedrock in some pedons.

Reaction in the Bt horizon is neutral or slightly alkaline.

The C horizon texture is sandy loam or fine sandy loam.

Rauzi Series

The Rauzi series consists of very deep, well drained soils on fan remnants and hills. The soils formed in alluvium and eolian deposits derived from mixed sources. Slopes range from 0 to 10 percent. Elevation is 4,300 to 4,800 feet. The average annual precipitation is 15 to 17 inches, the average annual air temperature is 45 to 49 degrees F., and the frost-free period is 105 to 130 days.

Taxonomic Class: Fine-loamy, mixed, superactive, mesic Aridic Haplustalfs

Typical pedon of Rauzi fine sandy loam, 0 to 6 percent slopes, 500 feet south and 2,000 feet east of the northwest corner of section 30, T. 50 N., R. 71 W.; USGS topographic quadrangle Gillette East, WY; 44 degrees 17 minutes 21 seconds north latitude and 105 degrees 26 minutes 28 seconds west longitude.

A—0 to 3 inches; pale brown (10YR 6/3) fine sandy loam, brown (10YR 4/3) moist; weak fine and

medium granular structure; soft, very friable, slightly sticky and nonplastic; neutral; clear smooth boundary.

Bt1—3 to 10 inches; yellowish brown (10YR 5/4) sandy clay loam, brown (10YR 4/3) moist; strong medium prismatic structure parting to strong medium subangular blocky; slightly hard, firm, slightly sticky and slightly plastic; few distinct discontinuous dark brown (10YR 3/3) clay films on faces of peds and in pores; neutral; clear smooth boundary.

Bt2—10 to 22 inches; yellowish red (5YR 5/6) sandy clay loam, yellowish red (5YR 4/6) moist; moderate medium prismatic structure parting to weak medium angular blocky; hard, firm, moderately sticky and moderately plastic; few distinct discontinuous dark reddish brown (5YR 3/4) clay films on faces of peds and in pores; slightly alkaline; clear smooth boundary.

Bt3—22 to 30 inches; yellowish brown (10YR 5/4) sandy clay loam, brown (10YR 4/3) moist; weak medium prismatic structure parting to moderate medium angular blocky; hard, firm, moderately sticky and moderately plastic; few distinct discontinuous dark brown (10YR 3/3) clay films on faces of peds and in pores; slightly alkaline; clear smooth boundary.

C—30 to 60 inches; brown (10YR 5/3) sandy loam, brown (10YR 4/3) moist; massive; slightly hard, very friable, slightly sticky and slightly plastic; slightly alkaline.

Depth to effervescent horizons is 40 to 60 inches or more.

The A horizon texture is fine sandy loam or sandy clay loam.

Reaction in the Bt horizon is neutral or slightly alkaline.

The C horizon texture is sandy loam or fine sandy loam.

Recluse Series

The Recluse series consists of very deep, well drained soils on alluvial fans and fan remnants. The soils formed in alluvium derived from mixed sources. Slopes range from 0 to 6 percent. Elevation is 4,100 to 5,000 feet. The average annual precipitation is 15 to 17 inches, the average annual air temperature is 45 to 49 degrees F., and the frost-free period is 105 to 130 days.

Taxonomic Class: Fine-loamy, mixed, superactive, mesic Aridic Argiustolls

Typical pedon of Recluse loam, 0 to 6 percent slopes, about 550 feet north and 2,050 feet east of the southwest corner of section 4, T. 47 N., R. 74 W.; USGS topographic quadrangle Double Tanks, WY; 44 degrees 4 minutes 25 seconds north latitude and 105 degrees 45 minutes 41 seconds west longitude.

A—0 to 5 inches; brown (10YR 4/3) loam, dark brown (10YR 3/3) moist; weak fine granular structure; soft, friable, slightly sticky and slightly plastic; neutral (pH 6.8); abrupt smooth boundary.

Bt1—5 to 12 inches; brown (10YR 5/3) clay loam, dark brown (10YR 3/3) moist; moderate medium prismatic structure parting to strong fine and medium angular blocky; hard, friable, moderately sticky and moderately plastic; few distinct discontinuous very dark grayish brown (10YR 3/2) clay films on faces of peds and in pores; neutral (pH 7.0); clear wavy boundary.

Bt2—12 to 17 inches; brown (10YR 5/3) clay loam, brown (10YR 4/3) moist; moderate medium prismatic structure parting to strong medium angular blocky; hard, friable, moderately sticky and moderately plastic; few distinct discontinuous dark brown (10YR 3/3) clay films on faces of peds and in pores; neutral (pH 7.2); abrupt wavy boundary.

Btk—17 to 23 inches; pale brown (10YR 6/3) clay loam, brown (10YR 5/3) moist; weak medium prismatic structure parting to moderate fine and medium angular blocky; hard, friable, moderately sticky and moderately plastic; few distinct discontinuous dark brown (10Y/R 3/3) clay films on faces of peds and in pores; common fine irregular light gray (10YR 7/2) carbonate threads throughout; strongly effervescent; slightly alkaline (pH 7.8); clear wavy boundary.

Bk1—23 to 42 inches; pale brown (10YR 6/3) loam, brown (10YR 5/3) moist; weak coarse and medium subangular blocky structure; slightly hard, friable, slightly sticky and moderately plastic; common fine irregular light gray (10YR 7/2) carbonate threads throughout; strongly effervescent; moderately alkaline (pH 8.4); gradual wavy boundary.

Bk2—42 to 60 inches; light brownish gray (10YR 6/2) loam, grayish brown (10YR 5/2) moist; weak medium and coarse subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common fine irregular light gray (10YR 7/2) carbonate threads throughout; strongly effervescent; moderately alkaline (pH 8.4).

The mollic epipedon is 8 to 15 inches thick and commonly includes the upper part of the argillic horizon. Depth to calcium carbonate accumulations ranges from 17 to 27 inches.

The Bk horizon texture is loam or clay loam.

Renohill Series

The Renohill series consists of moderately deep, well drained soils on hills and ridges. The soils formed in alluvium and residuum derived from shale. Slopes range from 0 to 15 percent. Elevation is 4,100 to 5,200 feet. The average annual precipitation is 10 to 14 inches, the average annual air temperature is 45 to 49 degrees F., and the frost-free period is 105 to 130 days.

Taxonomic Class: Fine, smectitic, mesic Ustic Haplargids

Typical pedon of Renohill clay loam, in an area of Ulm-Renohill clay loams, 0 to 6 percent slopes, about 200 feet east and 1,000 feet north of the southwest corner of section 21, T. 42 N., R. 70 W.; USGS topographic quadrangle Teckla, WY; 43 degrees 35 minutes 42 seconds north latitude and 105 degrees 16 minutes 58 seconds west longitude.

A—0 to 4 inches; grayish brown (10YR 5/2) clay loam, dark grayish brown (10YR 4/2) moist; moderate very fine and fine granular structure; soft, friable, slightly sticky and slightly plastic; many very fine and fine roots throughout; neutral; clear smooth boundary.

Bt1—4 to 9 inches; brown (10YR 5/3) clay loam, brown (10YR 4/3) moist; moderate medium prismatic structure parting to moderate medium subangular blocky; slightly hard, firm, moderately sticky and moderately plastic; many very fine and fine roots throughout; few distinct discontinuous dark brown (10YR 3/3) clay films on faces of peds and in pores; slightly alkaline; clear smooth boundary.

Bt2—9 to 19 inches; pale brown (10YR 6/3) clay, brown (10YR 5/3) moist; strong medium prismatic structure parting to strong fine angular blocky; hard, very firm, moderately sticky and moderately plastic; many very fine and fine roots throughout; few distinct discontinuous dark brown (10YR 3/3) clay films on faces of peds and in pores; moderately alkaline; clear smooth boundary.

Btk—19 to 24 inches; light brownish gray (10YR 6/2) clay loam, grayish brown (10YR 5/2) moist; moderate fine and medium prismatic structure parting to moderate fine and medium angular blocky; slightly hard, firm, moderately sticky and moderately plastic; many very fine and fine roots throughout; few distinct discontinuous dark brown (10YR 3/3) clay films on faces of peds and in pores; common fine irregular light gray (10YR 7/2) carbonate threads throughout; strongly effervescent; moderately alkaline; clear wavy boundary.

Bk—24 to 35 inches; pale brown (10YR 6/3) clay loam, brown (10YR 5/3) moist; moderate fine and medium subangular blocky structure; slightly hard, firm, moderately sticky and moderately plastic; many very fine and fine roots throughout; common fine irregular light gray (10YR 7/2) carbonate threads throughout; strongly effervescent; moderately alkaline; clear wavy boundary.

Cr—35 to 60 inches; soft calcareous shale.

Depth to calcium carbonate accumulations ranges from 12 to 19 inches. Depth to bedrock ranges from 20 to 40 inches.

The A horizon texture is clay loam or loam.

The Bt, Btk, and Bk horizon textures are clay loam or clay. Reaction is slightly alkaline or moderately alkaline in the Bt and Btk horizons.

Rockybutte Series

The Rockybutte series consists of very deep, well drained soils on plateaus and ridges. The soils formed in alluvium or loess over residuum weathered from porcelanite. Slopes range from 0 to 10 percent. Elevation is 4,100 to 4,800 feet. The average annual precipitation is 15 to 17 inches, the average annual air temperature is 45 to 49 degrees F., and the frost-free period is 105 to 130 days.

Taxonomic Class: Fine-loamy, mixed, superactive, mesic Aridic Haplustalfs

Typical pedon of Rockybutte loam, in an area of Brislawn-Rockybutte-Ironbutte complex, 0 to 10 percent slopes, about 2,500 feet west and 500 feet south of the northeast corner of section 18, T. 56 N., R. 71 W.; USGS topographic quadrangle Rocky Butte SW, WY; 44 degrees 55 minutes 13 seconds north latitude and 105 degrees 26 minutes 25 seconds west longitude.

A—0 to 4 inches; brown (7.5YR 4/3) loam, dark brown (7.5YR 3/3) moist; weak fine granular structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine and fine roots;

common fine pores; 5 percent angular porcelanite channers; neutral (pH 6.8); clear smooth boundary.

Bt1—4 to 10 inches; brown (7.5YR 4/4) clay loam, dark brown (7.5YR 3/4) moist; moderate medium prismatic structure parting to moderate fine and medium angular blocky; slightly hard, friable, moderately sticky and moderately plastic; common distinct discontinuous dark brown (7.5YR 3/3) clay films on faces of peds and in pores; 10 percent angular porcelanite channers; neutral; (pH 7.2); gradual wavy boundary.

Bt2—10 to 16 inches; brown (7.5YR 4/4) channery clay loam, dark brown (7.5YR 3/4) moist; moderate medium prismatic structure parting to moderate fine and medium subangular blocky; slightly hard, very friable, moderately sticky and moderately plastic; common distinct discontinuous dark brown (7.5YR 3/3) clay films on faces of peds and in pores; 20 percent angular porcelanite channers; slightly alkaline; (pH 7.4); clear wavy boundary.

Btk—16 to 23 inches; brown (7.5YR 5/4) very channery clay loam, brown (7.5YR 4/4) moist; moderate fine and medium subangular blocky structure; slightly hard, very friable; common distinct discontinuous dark brown (7.5YR 3/3) clay films on faces of peds and in pores; few fine irregular light gray (10YR 7/2) carbonate threads throughout; 35 percent angular porcelanite channers; strongly effervescent; moderately alkaline (pH 8.0); gradual wavy boundary.

Bk—23 to 29 inches; brown (7.5YR 5/4) extremely channery loam, brown (7.5YR 4/4) moist; weak fine and medium subangular blocky structure; soft, very friable; few distinct discontinuous light gray (10YR 7/2) carbonate coats on bottom surfaces of rock fragments; few fine irregular light gray (10YR 7/2) carbonate threads throughout; 60 percent angular porcelanite channers; strongly effervescent; moderately alkaline (pH 8.2); clear wavy boundary.

2C—29 to 60 inches; fractured porcelanite with 7 percent sandy loam filling interstices and voids, brown (7.5YR 5/4) sandy loam, brown (7.5YR 4/4) moist; massive; few distinct discontinuous light gray (10YR 7/2) carbonate coats on bottom surfaces of rock fragments; 65 percent angular porcelanite channers, 20 percent subangular porcelanite flagstones, and 8 percent subrounded stones; slightly effervescent but variable; soil matrix is noneffervescent but contains few segregated masses or threads of calcium carbonates.

Depth to calcium carbonate accumulations ranges from 18 to 31 inches. The depth to a fragmental discontinuity is 20 to 40 inches.

Rock fragments in the A horizon range from 0 to 14 percent angular porcelanite channers.

The Bt1 horizon texture is loam or clay loam. Rock fragments range from 0 to 14 percent porcelanite channers.

The Bt2 horizon texture is channery loam or very channery clay loam. Reaction is slightly alkaline to moderately alkaline. Rock fragments range from 15 to 50 percent porcelanite channers.

The Btk horizon texture is channery or very channery loam or clay loam. Rock fragments range from 15 to 50 percent porcelanite channers.

The Bk horizon texture is very or extremely channery loam. Reaction is slightly alkaline or moderately alkaline. Rock fragments range from 35 to 75 percent channers and 0 to 5 percent flagstones.

The C horizon texture is fractured porcelanite with less than 10 percent of interstices or voids filled with sandy loam. Reaction is neutral or slightly alkaline. Rock fragments range from 60 to 95 percent channers, 0 to 15 percent flagstones, and 0 to 5 percent stones.

Rockypoint Series

The Rockypoint series consists of very deep, well and moderately well drained soils on flood plains and stream terraces. The soils formed in alluvium derived from mixed sources. Slopes range from 0 to 6 percent. Elevation is 4,300 to 4,800 feet. The average annual precipitation is 15 to 17 inches, the average annual air temperature is 45 to 49 degrees F., and the frost-free period is 105 to 130 days.

Taxonomic Class: Fine-loamy, mixed, superactive, calcareous, mesic Aridic Ustifluvents

Typical pedon of Rockypoint loam, in an area of Rockypoint-Iwait association, 0 to 6 percent slopes, about 1,160 feet west and 2,350 feet south of the northeast corner of section 2, T. 51 N., R. 75 W.; 44 degrees 25 minutes 36 seconds north latitude and 105 degrees 50 minutes 13 seconds west longitude.

A—0 to 3 inches; grayish brown (10YR 5/2) loam, brown (10YR 4/3) moist; weak fine platy structure; slightly hard, friable, sticky and slightly plastic; common fine and very fine and few coarse and medium roots; slightly effervescent; calcium carbonate disseminated; slightly alkaline (pH 7.6); clear smooth boundary.

C1—3 to 30 inches; pale brown (10YR 6/3) clay loam, stratified with thin layers of sandy loam, loam, silt loam, and silty clay loam, brown (10YR 5/3) moist; massive; hard, friable, sticky and plastic; common fine and very fine and few coarse and medium roots to about 25 inches, few fine and very fine roots below; slightly effervescent; calcium carbonate disseminated; moderately alkaline (pH 8.0); clear smooth boundary.

C2—30 to 60 inches; pale brown (10YR 6/3) loam, stratified with thin layers of loamy sand, sandy loam, very fine sandy loam, and clay loam, brown (10YR 5/3) moist; massive; hard, friable, slightly sticky and plastic; few fine and very fine roots; slightly effervescent; calcium carbonate disseminated; moderately alkaline (pH 8.2).

Depth to continuous accumulations of carbonate is 0 to 10 inches. Rock fragments range from 0 to 10 percent.

Electrical conductivity ranges from 0 to 2 millimhos per centimeter in the A horizon.

The C horizon texture is clay loam or loam, stratified with thin layers of very fine sandy loam, sandy loam, silt loam, silty clay loam, and loamy sand. Reaction is slightly alkaline to moderately alkaline. Electrical conductivity ranges from 4 to 8 millimhos per centimeter. Sodium adsorption ratio is 0 to 5.

Sabatka Series

The Sabatka series consists of moderately deep, well drained soils on ridges and hills. The soils formed in residuum or alluvium over residuum derived from noncalcareous shale. Slopes range from 3 to 30 percent. Elevation is 4,100 to 4,800 feet. The average annual precipitation is 15 to 17 inches, the average annual air temperature is 45 to 49 degrees F., and the frost-free period is 105 to 130 days.

Taxonomic Class: Fine, smectitic, mesic Aridic Haplustepts

Typical pedon of Sabatka clay loam, about 1,750 feet east and 200 feet south of the northwest corner of section 33, T. 57 N., R. 69 W.; USGS topographic quadrangle Mittenbutte, WY; 44 degrees 52 minutes 20 seconds north latitude and 105 degrees 8 minutes 39 seconds west longitude.

A—0 to 3 inches; grayish brown (2.5Y 5/2) clay loam, dark grayish brown (2.5Y 4/2) moist; strong fine and medium angular blocky structure; very hard, firm, moderately sticky and moderately plastic; neutral; clear smooth boundary.

Bw—3 to 19 inches; dark grayish brown (2.5Y 4/2) clay, very dark grayish brown (2.5Y 3/2) moist; strong medium prismatic structure parting to strong fine and medium angular blocky; extremely hard, very firm, very sticky and very plastic; neutral; clear wavy boundary.

C—19 to 30 inches; dark olive gray (5Y 3/2) clay, black (5Y 2/2) moist; moderate fine and medium angular blocky structure; very hard, firm, moderately sticky and moderately plastic; neutral; abrupt wavy boundary.

Cr—30 to 60 inches; noncalcareous clayey shale.

Depth to bedrock ranges from 20 to 40 inches.

Some pedons have up to 25 percent channers on the surface of the A horizon.

The Bw and C horizon textures are clay or clay loam.

Reaction in the C horizon is slightly acid to slightly alkaline. One to two percent authigenic gypsum occurs in some pedons. Sodium adsorption ratio is 0 to 5.

Samday Series

The Samday series consists of shallow, well drained soils on hills and ridges. The soils formed in residuum derived from shale. Slopes range from 3 to 45 percent. Elevation is 4,100 to 5,800 feet. The average annual precipitation is 10 to 14 inches, the average annual air temperature is 45 to 49 degrees F., and the frost-free period is 105 to 130 days.

Taxonomic Class: Clayey, smectitic, calcareous, mesic, shallow Ustic Torriorthents

Typical pedon of Samday clay loam, in an area of Samday-Savageton clay loams, 3 to 15 percent slopes, about 1,900 feet south and 2,100 feet west of the northeast corner of section 7, T. 47 N., R. 71 W.

A—0 to 2 inches; pale brown (10YR 6/3) clay loam, dark grayish brown (10YR 4/2) moist; weak fine subangular blocky structure; hard, firm, sticky and plastic; many fine and very fine roots; slightly alkaline; clear smooth boundary.

C—2 to 16 inches; light brownish gray (10YR 6/2) silty clay, dark grayish brown (10YR 4/2) moist; massive; very hard, very firm, very sticky and very plastic; common fine and very fine roots; strongly effervescent; calcium carbonate mostly disseminated; moderately alkaline; clear wavy boundary.

Cr—16 to 60 inches; soft effervescent shale.

Depth to bedrock ranges from 7 to 20 inches.

Depth to effervescent layers ranges from 0 to 6 inches.

Reaction in the A horizon is neutral to moderately alkaline. Electrical conductivity ranges from 0 to 2 millimhos per centimeter.

The C horizon texture is silty clay or clay. Reaction is slightly alkaline or moderately alkaline. Rock fragments range from 0 to 15 percent hard shale channers. One percent authigenic gypsum occurs in some pedons. Electrical conductivity ranges from 2 to 4 millimhos per centimeter. Sodium adsorption ratio is 0 to 5.

Samsil Series

The Samsil series consists of shallow, well drained soils on ridges or hills. The soils formed in residuum derived from shale. Slopes range from 3 to 45 percent. Elevation is 4,100 to 5,800 feet. The average annual precipitation is 15 to 17 inches, the average annual air temperature is 45 to 49 degrees F., and the frost-free period is 105 to 130 days.

Taxonomic Class: Clayey, smectitic, calcareous, mesic, shallow Aridic Ustorthents

Typical pedon of Samsil clay loam, about 2,100 feet south and 1,450 feet east of the northwest corner of section 32, T. 56 N., R. 72 W.; USGS topographic quadrangle Whitetail Butte, WY; 44 degrees 47 minutes 43 seconds north latitude and 105 degrees 32 minutes 55 seconds west longitude.

A—0 to 4 inches; light yellowish brown (10YR 6/4) clay loam, dark yellowish brown (10YR 4/4) moist; moderate fine and medium subangular blocky structure parting to moderate fine and medium granular; hard, firm, very sticky and very plastic; many very fine and fine roots throughout; many very fine and fine pores; slightly effervescent; neutral; clear smooth boundary.

C—4 to 15 inches; light yellowish brown (2.5Y 6/4) clay, light yellowish brown (2.5Y 6/3) moist; strong medium and coarse angular blocky structure; very hard, firm, very sticky and very plastic; many very fine and fine roots throughout; many very fine and fine pores; common fine irregular light gray (10YR 7/2) carbonate threads throughout; strongly effervescent; 5 percent gravel; moderately alkaline; gradual wavy boundary.

Cr—15 to 60 inches; soft calcareous shale interbedded with mudstone and sandstone.

Depth to bedrock ranges from 6 to 20 inches. Depth to effervescent layers ranges from 0 to 6 inches.

Reaction in the A horizon is neutral to moderately alkaline.

The C horizon texture is clay or clay loam. Reaction is slightly alkaline or moderately alkaline. Rock fragments range from 5 to 40 percent hard shale channers. One percent authigenic gypsum occurs in some pedons.

Savageton Series

The Savageton series consists of moderately deep, well drained soils on hills and ridges. The soils formed in residuum derived from shale. Slopes range from 0 to 15 percent. Elevation is 4,100 to 5,200 feet. The average annual precipitation is 10 to 16 inches, the average annual air temperature is 45 to 49 degrees F., and the frost-free period is 105 to 130 days.

Taxonomic Class: Fine, smectitic, mesic Ustic Haplocambids

Typical pedon of Savageton clay loam, in an area of Samday-Savageton clay loams, 3 to 15 percent slopes, about 1,000 feet west and 1,200 feet south of the northeast corner of section 21, T. 49 N., R. 73 W.

A—0 to 5 inches; brown (10YR 5/3) clay loam, dark brown (10YR 4/3) moist; moderate medium and fine granular structure; slightly hard, firm, sticky and plastic; few coarse and medium and many fine roots; slightly alkaline; clear wavy boundary.

Bw—5 to 15 inches; light brownish gray (2.5Y 6/2) clay, light olive brown (2.5Y 5/4) moist; weak medium and fine prismatic structure parting to moderate medium and fine subangular blocky; very hard, firm, very sticky and plastic; few coarse and medium and common fine roots; slightly effervescent; calcium carbonate disseminated; moderately alkaline; clear wavy boundary.

Bk—15 to 28 inches; light yellowish brown (2.5Y 6/4) clay, light olive brown (2.5Y 5/4) moist; massive; very hard, firm, very sticky and very plastic; few coarse, medium, and fine roots; strongly effervescent; few to common fine irregularly shaped filaments and threads of calcium carbonate and fine crystals of gypsum; strongly alkaline; gradual wavy boundary.

Cr—28 to 60 inches; soft interbedded sandy and silty shale.

Depth to calcium carbonate accumulations ranges from 0 to 6 inches. Depth to bedrock ranges from 20 to 40 inches.

Reaction in the A horizon is slightly or moderately alkaline.

The Bw horizon texture is clay or clay loam.

The Bk horizon texture is clay or clay loam. One percent authigenic gypsum occurs in some pedons. Electrical conductivity ranges from 0 to 2 millimhos per centimeter. Sodium adsorption ratio is 0 to 5.

Shingle Series

The Shingle series consists of shallow, well drained soils on hills and ridges. The soils formed in residuum derived from shale and sandstone. Slopes range from 3 to 60 percent. Elevation is 4,100 to 5,800 feet. The average annual precipitation is 10 to 14 inches, the average annual air temperature is 45 to 49 degrees F., and the frost-free period is 105 to 130 days.

Taxonomic Class: Loamy, mixed, superactive, calcareous, mesic, shallow Ustic Torriorthents

Typical pedon of Shingle loam, in an area of Theedle-Shingle loams, 3 to 30 percent slopes, about 800 feet south and 1,800 feet west of the northeast corner of section 36, T. 52 N., R. 76 W.; USGS topographic quadrangle Echeta, WY; 44 degrees 26 minute 42 seconds north latitude and 105 degrees 56 minutes 27 seconds west longitude.

A—0 to 2 inches; brown (10YR 5/3) loam, dark brown (10YR 3/3) moist; weak fine granular structure; soft, very friable, nonsticky and nonplastic; common fine and very fine roots throughout; slightly alkaline; clear smooth boundary.

C1—2 to 7 inches; light yellowish brown (10YR 6/4) loam, brown (10YR 4/3) moist; weak medium subangular blocky structure; soft, very friable, nonsticky and slightly plastic; common fine and very fine roots throughout; strongly effervescent; moderately alkaline; clear smooth boundary.

C2—7 to 12 inches; very pale brown (10YR 7/3) loam, yellowish brown (10YR 5/4) moist; massive; soft, very friable, nonsticky and slightly plastic; common fine and very fine roots throughout; common fine irregular light gray (10YR 7/2) carbonate threads throughout; violently effervescent; moderately alkaline; abrupt smooth boundary.

Cr—12 to 60 inches; very pale brown (10YR 7/3) soft calcareous shale.

Depth to bedrock is 10 to 20 inches. Depth to calcium carbonate accumulations ranges from 0 to 6 inches.

The A horizon texture is loam or clay loam. Reaction is neutral to moderately alkaline.

The C horizon texture is loam or clay loam. Electrical conductivity ranges from 0 to 2 millimhos per centimeter.

Silhouette Series

The Silhouette series consists of very deep, well drained soils on hills and ridges. The soils formed in alluvium derived from shale. Slopes range from 0 to 15 percent. Elevation is 4,100 to 5,200 feet. The average annual precipitation is 10 to 14 inches, the average annual air temperature is 45 to 49 degrees F., and the frost-free period is 105 to 130 days.

Taxonomic Class: Fine, smectitic, mesic Ustic Haplocambids

Typical pedon of Silhouette clay loam, in an area of Savageton-Silhouette clay loams, 0 to 6 percent slopes, about 500 feet east and 850 feet south of the northwest corner of section 30, T. 42 N., R. 71 W.

A—0 to 2 inches; yellowish brown (10YR 5/4) clay loam, dark brown (10YR 4/3) moist; moderate fine granular structure; slightly hard, friable, sticky and plastic; few medium and many fine and very fine roots; slightly alkaline; abrupt wavy boundary.

Bw1—2 to 16 inches; pale brown (10YR 6/3) clay loam, brown (10YR 5/3) moist; moderate medium prismatic structure parting to strong medium subangular blocky; hard, firm, sticky and plastic; few medium and common fine and very fine roots; slightly effervescent; calcium carbonate disseminated; moderately alkaline; clear wavy boundary.

Bw2—16 to 28 inches; light yellowish brown (10YR 6/4) clay loam, yellowish brown (10YR 5/4) moist; weak medium prismatic structure parting to moderate medium and fine subangular blocky; hard, firm, sticky and plastic; few medium, fine, and very fine roots; strongly effervescent; few medium and fine irregularly shaped threads of calcium carbonate; moderately alkaline; clear wavy boundary.

Bk—28 to 60 inches; light yellowish brown (2.5Y 6/4) silty clay loam, light olive brown (2.5Y 5/4) moist; massive; hard, firm, sticky and plastic; few medium, fine, and very fine roots; strongly effervescent; many medium and fine irregularly shaped threads and masses of calcium carbonate; moderately alkaline.

Depth to calcium carbonate accumulations ranges from 0 to 8 inches.

The Bw horizon texture is clay or clay loam. Reaction is slightly alkaline or moderately alkaline.

The Bk horizon texture is silty clay loam, clay loam, or clay. Electrical conductivity ranges from 2 to 4 millimhos per centimeter. Sodium adsorption ratio is 0 to 5.

Sodawells Series

The Sodawells series consists of very deep, well drained soils on flood plains and stream terraces. The soils formed in alluvium derived from mixed sources. Slopes range from 0 to 3 percent. Elevation is 3,500 to 4,500 feet. The average annual precipitation is 15 to 17 inches, the average annual air temperature is 45 to 49 degrees F., and the frost-free period is 105 to 130 days.

Taxonomic Class: Coarse-loamy, mixed, superactive, calcareous, mesic Aridic Ustifluvents

Typical pedon of Sodawells fine sandy loam, about 2,500 feet south and 300 feet west of the northeast corner of section 19, T. 54 N., R. 60 W.; USGS topographic quadrangle Weston, WY; 44 degrees 39 minutes 2 seconds north latitude and 105 degrees 18 minutes 41 seconds west longitude.

A—0 to 5 inches; brown (10YR 5/3) fine sandy loam, brown (10YR 4/3) moist; weak fine and medium subangular blocky structure parting to weak fine granular; slightly hard, very friable, slightly sticky and nonplastic; many fine and very fine and common medium roots throughout; many very fine and fine pores; neutral; clear wavy boundary.

C1—5 to 40 inches; light yellowish brown (2.5Y 6/3) fine sandy loam, light olive brown (2.5Y 5/3) moist; stratified with thin layers of silt loam, loamy fine sand, and very fine sandy loam; moderate fine and medium subangular blocky structure parting to weak fine granular; slightly hard, very friable, nonsticky and nonplastic; many fine and very fine roots throughout; many very fine and fine pores; strongly effervescent; 1 percent gravel; slightly alkaline

C2—40 to 80 inches; light yellowish brown (2.5Y 6/3) fine sandy loam, light olive brown (2.5Y 5/3) moist; stratified with thin layers of silt loam, loamy fine sand, and very fine sandy loam; few fine prominent strong brown (7.5YR 5/6) redoximorphic concentrations and few fine prominent gray (10YR 6/1) redoximorphic depletions; massive; slightly hard, very friable, nonsticky and nonplastic; strongly effervescent; 1 percent gravel; slightly alkaline.

Depth to calcium carbonates ranges from 0 to 8 inches. Rock fragments range from 0 to 5 percent. Flooding is rare to frequent for very brief or brief periods.

Reaction in the A horizon is neutral to moderately alkaline.

Reaction in the C horizon is slightly alkaline to strongly alkaline.

Spottedhorse Series

The Spottedhorse series consists of moderately deep, well drained soils on hills and ridges. The soils formed in residuum or alluvium over residuum derived primarily from shale. Slopes range from 0 to 6 percent. Elevation is 4,300 to 4,800 feet. The average annual precipitation is 15 to 17 inches, the average annual air temperature is 45 to 49 degrees F., and the frost-free period is 105 to 130 days.

Taxonomic Class: Fine, smectitic, mesic Aridic Paleustalfs

Typical pedon of Spottedhorse loam, in an area of Jaywest-Spottedhorse loams, 0 to 6 percent slopes, about 600 feet north and 2,300 feet east of the southwest corner of section 5, T. 55 N., R. 74 W.; USGS topographic quadrangle Reservoir Creek, WY; 44 degrees 46 minutes 4 seconds north latitude and 105 degrees 47 minutes 35 seconds west longitude.

E—0 to 4 inches; light brownish gray (10YR 6/2) loam, brown (10YR 4/3) moist; strong medium, thin, and very thin platy structure; slightly hard, very friable, nonsticky and slightly plastic; thin vesicular crust on soil surface; many fine and very fine roots throughout; neutral (pH 7.0); abrupt smooth boundary.

Bt—4 to 13 inches; yellowish brown (10YR 5/4) clay, dark yellowish brown (10YR 3/4) moist; strong medium prismatic structure parting to strong medium and fine angular blocky; extremely hard, very firm, very sticky and very plastic; many very fine and fine roots; few prominent dark brown

(10YR 3/3) clay films on faces of peds and lining pores and root channels; neutral (pH 7.2); clear smooth boundary.

Btk—13 to 27 inches; light brownish gray (10YR 6/2) clay loam, brown (10YR 5/3) moist; strong coarse prismatic structure parting to strong medium and fine angular blocky; very hard, firm, moderately sticky and moderately plastic; many fine and very fine roots; few distinct dark brown (10YR 3/3) clay films on faces of peds and in pores; strongly effervescent; common fine irregular light gray (10YR 7/2) threads of calcium carbonate; moderately alkaline (pH 8.4); clear smooth boundary

Bk—27 to 35 inches; light gray (10YR 7/2) clay loam, brown (10YR 5/3) moist; moderate medium subangular blocky structure; hard, friable, moderately sticky and moderately plastic; common fine roots; strongly effervescent; common fine irregular very pale brown (10YR 8/2) threads of calcium carbonate; moderately alkaline (pH 8.4); clear wavy boundary.

Cr—35 to 60 inches; soft shale; slightly effervescent in the upper 9 inches and noneffervescent below.

Depth to bedrock ranges from 20 to 40 inches. Depth to accumulations of calcium carbonate ranges from 12 to 19 inches.

Reaction in the E horizon is slightly acid or neutral.

The Bt horizon texture is clay loam or clay. Reaction is neutral or slightly alkaline.

The Btk horizon texture is clay loam or clay. Reaction is slightly alkaline or moderately alkaline.

Electrical conductivity in the Bk horizon ranges from 2 to 4 millimhos per centimeter. Sodium adsorption ratio is 0 to 5.

Taluce Series

The Taluce series consists of shallow, well drained soils on ridges and hills. The soils formed in residuum derived from sandstone. Slopes range from 3 to 40 percent. Elevation is 4,100 to 5,200 feet. The average annual precipitation is 10 to 14 inches, the average annual air temperature is 45 to 49 degrees F., and the frost-free period is 105 to 130 days.

Taxonomic Class: Loamy, mixed, superactive, calcareous, mesic, shallow Ustic Torriorthents

Typical pedon of Taluce fine sandy loam, in an area of Turnercrest-Keeline-Taluce fine sandy loams, 6 to 30 percent slopes, about 2,400 feet east and 1,900 feet north of the southwest corner of section 21, T. 45 N., R. 75 W.

A—0 to 2 inches; brown (10YR 5/3) fine sandy loam, dark brown (10YR 3/3) moist; weak fine granular structure; soft, very friable, nonsticky and nonplastic; carbonates are disseminated throughout; strongly effervescent; slightly alkaline; clear smooth boundary.

C—2 to 14 inches; yellowish brown (10YR 5/4) fine sandy loam, dark yellowish brown (10YR 4/4) moist; massive; soft, very friable, nonsticky and nonplastic; carbonates are disseminated throughout; strongly effervescent; moderately alkaline; clear smooth boundary.

Cr—14 to 60 inches; soft calcareous sandstone.

Depth to bedrock ranges from 10 to 20 inches. Depth to calcium carbonate accumulations ranges from 0 to 4 inches.

The A horizon texture is sandy loam or fine sandy loam. Reaction is neutral to moderately alkaline.

The C horizon texture is sandy loam or fine sandy loam. Reaction is moderately alkaline or strongly alkaline. Rock fragments range from 0 to 5 percent.

Note: The Taluce soil in map units 114, 140, 150, and 161 are taxadjuncts to the Taluce series. The soil in these map units is slightly acid or neutral throughout, and is noneffervescent in the C horizon. These soils are loamy, mixed, superactive, nonacid, mesic, shallow Ustic Torriorthents.

Teckla Series

The Teckla series consists of very deep, well drained soils on terraces and mesas. The soils formed in alluvium or eolian deposits over residuum weathered from porcelanite. Slopes range from 0 to 6 percent. Elevation is 4,200 to 5,200 feet. The average annual precipitation is 10 to 14 inches, the average annual air temperature is 45 to 49 degrees F., and the frost-free period is 105 to 130 days.

Taxonomic Class: Fine-loamy, mixed, superactive, mesic Ustic Haplargids

Typical pedon of Teckla very fine sandy loam, 0 to 10 percent slopes, about 2,000 feet north and 2,500 feet east of the southwest corner of section 36, T. 43 N., R. 70 W.; 43 degrees 39 minutes 4 seconds north latitude and 105 degrees 14 minutes 2 seconds west longitude.

A—0 to 5 inches; pale brown (10YR 6/3) very fine sandy loam, brown (10YR 4/3) moist; weak thin platy structure parting to weak fine granular; soft, very friable; many fine and very fine roots; neutral (pH 6.6); clear smooth boundary.

AB—5 to 10 inches; brown (10YR 5/3) very fine sandy loam, brown (10YR 4/3) moist; moderate medium angular blocky structure; slightly hard, friable; few fine and many very fine roots; neutral (pH 6.8); clear smooth boundary.

Bt—10 to 23 inches; brown (7.5YR 5/4) sandy clay loam, dark brown (7.5YR 4/4) moist; moderate medium and fine angular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common fine and many very fine roots; many faint clay films bridging sand grains; neutral (pH 7.0); clear smooth boundary.

2Bt—23 to 31 inches; brown (7.5YR 5/4) channery loam, dark brown (7.5YR 4/4) moist; moderate fine and medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common fine and very fine roots; 20 percent medium and fine angular porcelanite channers; many prominent clay films on faces of peds; slightly alkaline (pH 7.0); clear wavy boundary.

2Bk—31 to 45 inches; light reddish brown (5YR 6/4) very channery loam, reddish brown (5YR 4/4) moist; massive; soft, very friable; common fine and very fine roots; 40 percent medium and fine angular porcelanite channers; strongly effervescent; calcium carbonate disseminated and in masses; strongly alkaline (pH 9.0); clear wavy boundary.

2C—45 to 60 inches; light reddish brown (2.5YR 6/4) extremely channery sandy loam, red (2.5YR 5/6) moist; massive; slightly hard, friable, nonsticky and nonplastic; few fine and very fine roots; 45 percent angular channers, 15 percent cobbles, and 5 percent stones; soil matrix is noneffervescent but contains few segregated masses of calcium carbonate; slightly alkaline (pH 7.8).

Depth to calcium carbonate accumulations ranges from 20 to 31 inches. Depth to a fragmental discontinuity: 20 to 40 inches

The Bt horizon texture is clay loam or sandy clay loam. Reaction is neutral or slightly alkaline. Rock fragments range from 0 to 15 percent porcelanite channers.

The 2Bt horizon texture is channery loam or channery clay loam. Reaction is neutral or slightly alkaline. Rock fragments range from 15 to 25 percent porcelanite channers.

The 2Bk horizon texture is very channery loam or very channery sandy loam. Rock fragments range from 35 to 45 percent angular porcelanite channers and 0 to 5 percent cobbles.

The C horizon texture is extremely channery sandy loam or loamy sand. Reaction is neutral or moderately alkaline. Rock fragments range from 50 to 90 percent, of which 40 to 60 percent are channers, 0 to 15 percent cobbles, and 0 to 5 percent stones.

Terro Series

The Terro series consists of moderately deep, well drained soils on hills and ridges. The soils formed in alluvium and residuum derived from sandstone. Slopes range from 2 to 30 percent. Elevation is 4,100 to 5,200 feet. The average annual precipitation is 10 to 14 inches, the average annual air temperature is 45 to 49 degrees F., and the frost-free period is 105 to 130 days.

Taxonomic Class: Coarse-loamy, mixed, superactive, mesic Ustic Haplargids

Typical pedon of Terro fine sandy loam, in an area of Vonalee-Terro fine sandy loams, 2 to 10 percent slopes, about 150 feet south and 1,200 feet east of the northwest corner of section 3, T. 42 N., R. 72 W.

A—0 to 3 inches; brown (10YR 5/3) fine sandy loam, brown (10YR 4/3) moist; weak medium granular structure; soft, very friable, nonsticky and nonplastic; neutral; clear smooth boundary.

Bt—3 to 10 inches; yellowish brown (10YR 5/4) fine sandy loam, dark yellowish brown (10YR 3/4) moist; weak medium subangular blocky structure; slightly hard, very friable, nonsticky and slightly plastic; few distinct discontinuous dark brown (10YR 3/3) clay bridging between sand grains; neutral; clear wavy boundary.

Btk—10 to 16 inches; yellowish brown (10YR 5/4) fine sandy loam, dark yellowish brown (10YR 4/4) moist; weak medium subangular blocky structure; slightly hard, very friable, nonsticky and slightly plastic; few distinct discontinuous dark brown (10YR 3/3) clay bridging between sand grains; carbonates are disseminated throughout; strongly effervescent; moderately alkaline; clear smooth boundary.

Bk—16 to 23 inches; pale brown (10YR 6/3) fine sandy loam, brown (10YR 4/3) moist; weak medium subangular blocky structure; slightly hard, very friable, nonsticky and slightly plastic; carbonates are disseminated throughout; strongly effervescent; moderately alkaline; abrupt smooth boundary.

Cr—23 to 60 inches; soft calcareous sandstone.

Depth to calcium carbonate accumulations ranges from 15 to 20 inches. Depth to bedrock ranges from 20 to 40 inches.

The A, Bt, Btk, and Bk horizon textures are sandy loam or fine sandy loam. Reaction is neutral or slightly alkaline in the A horizon and slightly alkaline or moderately alkaline in the Btk and Bk horizons.

Theedle Series

The Theedle series consists of moderately deep, well drained soils on hills and ridges. The soils formed in residuum or alluvium over residuum derived from mixed sources. Slopes range from 0 to 30 percent. Elevation is 4,100 to 5,200 feet. The average annual precipitation is 10 to 14 inches, the average annual air temperature is 45 to 49 degrees F., and the frost-free period is 105 to 130 days.

Taxonomic Class: Fine-loamy, mixed, superactive, calcareous, mesic Ustic Torriorthents

Typical pedon of Theedle loam, in an area of Cushman-Theedle loams, 0 to 6 percent slopes, about 2,050 feet south and 1,900 feet east of the northwest corner of section 10, T. 47 N., R. 71 W.; USGS topographic quadrangle The Gap SW, WY; 44 degrees 4 minutes 2 seconds north latitude and 105 degrees 22 minutes 30 seconds west longitude

A—0 to 2 inches; pale brown (10YR 6/3) loam, dark grayish brown (10YR 4/2) moist; weak fine granular structure; soft, friable, slightly sticky and slightly plastic; carbonates are disseminated throughout; slightly effervescent; moderately alkaline; clear smooth boundary.

Bk1—2 to 12 inches; brown (10YR 5/3) loam, dark grayish brown (10YR 4/2) moist; weak medium angular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common fine irregular light gray (10YR 7/2) carbonate threads throughout; strongly effervescent; moderately alkaline; clear smooth boundary.

Bk2—12 to 28 inches; pale brown (10YR 6/3) clay loam, brown (10YR 5/3) moist; moderate medium subangular blocky structure; slightly hard, firm, moderately sticky and moderately plastic; many fine irregular light gray (10YR 7/2) carbonate threads throughout; violently effervescent; moderately alkaline; clear wavy boundary.

Cr—28 to 60 inches; soft calcareous shale.

Depth to bedrock ranges from 20 to 40 inches. Depth to calcium carbonate accumulations ranges from 0 to 6 inches.

Reaction in the A horizon is neutral to moderately alkaline.

The Bk horizon texture is clay loam or loam. Electrical conductivity ranges from 0 to 2 millimhos per centimeter. Sodium adsorption ratio is 0 to 5.

Torriarents

Torriarents consist of deep, well and somewhat excessively drained soils on hills and ridges. The soils formed in overburden derived from mining operations. Slopes range from 2 to 20 percent. Elevation is 4,100 to 5,000 feet. The average annual precipitation is 10 to 17 inches, the average annual air temperature is 45 to 49 degrees, and the frost-free period is 105 to 130 days.

Taxonomic Class: Torriarents

Typical pedon of Torriarents, in an area of Torriarents-Torriorthents complex, reclaimed; about 1,200 feet east and 1,300 feet south of the northwest corner of section 16, T. 43 N., R. 70 W.; USGS topographic quadrangle Reno Reservoir, WY; 43 degrees 42 minutes 18 seconds north latitude and 105 degrees 16 minutes 35 seconds west longitude.

A—0 to 4 inches; pale brown (10YR 6/3) clay loam, brown (10YR 5/3) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; common very fine and fine roots throughout; slightly effervescent; slightly alkaline (pH 7.8); clear smooth boundary.

C1—4 to 42 inches; very pale brown (10YR 7/3) clay loam, pale brown (10YR 6/3) moist; massive; hard, firm, moderately sticky and moderately plastic; common very fine and fine roots throughout; 10 percent by volume argillic horizon fragments with few fine distinct brown (10YR 4/3) clay films on ped faces; strongly effervescent; slightly alkaline (pH 7.8); clear smooth boundary.

C2—42 to 60 inches; light gray (10YR 7/2) clay loam, light brownish gray (10YR 6/2) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; common very fine and fine roots throughout; strongly effervescent (pH 8.0); moderately alkaline.

Depth to calcium carbonate accumulations ranges from 0 to 6 inches. Rock fragments range from 0 to 5 percent. Electrical conductivity ranges from 0 to 2 millimhos per centimeter.

The A horizon texture is variable, but commonly is fine sandy loam, loam, or clay loam. Reaction is slightly alkaline or moderately alkaline.

The C horizon texture is variable, but commonly is fine sandy loam, loam, clay loam, or sandy clay loam. Reaction is slightly alkaline or moderately alkaline. Sodium adsorption ratio is 0 to 5.

Torriorthents

Torriorthents consist of deep, well and somewhat excessively drained soils on hills and ridges. The soils formed in overburden derived from mining operations. Slopes range from 2 to 20 percent. Elevation is 4,100 to 5,000 feet. The average annual precipitation is 10 to 17 inches, the average annual air temperature is 45 to 49 degrees, and the frost-free period is 105 to 130 days.

Taxonomic Class: Torriorthents

Typical pedon of Torriorthents, in an area of Torriarents-Torriorthents complex, reclaimed; about 200 feet west and 1,900 feet north of the southeast corner of section 28, T. 50 N., R. 71 W.; USGS topographic quadrangle Gillette East, WY; 44 degrees 16 minutes 54 seconds north latitude and 105 degrees 23 minutes 19 seconds west longitude.

A—0 to 5 inches; pale brown (10YR 6/3) loam, brown (10YR 4/3) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; common very fine and fine roots throughout; slightly effervescent; moderately alkaline; clear smooth boundary.

C1—5 to 44 inches; light yellowish brown (10YR 6/4) clay loam, yellowish brown (10YR 5/4) moist; massive; hard, firm, moderately sticky and moderately plastic; common very fine and fine roots throughout; strongly effervescent; moderately alkaline; clear smooth boundary.

C2—44 to 60 inches; pale brown (10YR 6/3) loam, brown (10YR 5/3) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; common very fine and fine roots throughout; strongly effervescent; moderately alkaline.

Depth to calcium carbonate accumulations ranges from 0 to 6 inches. Rock fragments range from 0 to 5 percent. Electrical conductivity ranges from 0 to 2 millimhos per centimeter.

The A horizon texture is variable, but commonly is fine sandy loam, loam, or clay loam. Reaction is slightly alkaline or moderately alkaline.

The C horizon texture is variable, but commonly is fine sandy loam, loam, clay loam, or sandy clay loam. Reaction is slightly alkaline or moderately alkaline. Sodium adsorption ratio is 0 to 5.

Tullock Series

The Tullock series consists of moderately deep, excessively drained soils on ridges, hills, and dunes. The soils formed in eolian deposits over residuum derived from sandstone. Slopes range from 3 to 30 percent. Elevation is 4,100 to 5,200 feet. The average annual precipitation is 10 to 14 inches, the average annual air temperature is 45 to 49 degrees, and the frost-free period is 105 to 130 days.

Taxonomic Class: Mixed, mesic Ustic Torripsamments

Typical pedon of Tullock loamy sand, in an area of Keeline-Tullock loamy sands, 6 to 30 percent slopes, about 2,100 feet west and 2,500 feet south of the northeast corner of section 31, T. 46 N., R. 74 W.

A—0 to 4 inches; brown (10YR 5/3) loamy sand, brown (10YR 4/3) moist; single grain; loose, friable, nonsticky and nonplastic; neutral; clear smooth boundary.

C—4 to 28 inches; pale brown (10YR 6/3) loamy sand, brown (10YR 5/3) moist; single grain; soft, friable, nonsticky and nonplastic; carbonates are disseminated throughout; slightly effervescent; slightly alkaline; clear smooth boundary.

Cr—28 to 60 inches; soft calcareous sandstone.

Depth to bedrock ranges from 20 to 40 inches. Depth to calcium carbonate accumulations ranges from 0 to 6 inches.

Reaction in the A horizon is neutral or slightly alkaline.

The C horizon texture is loamy sand, loamy fine sand, or sand. Reaction is slightly alkaline or moderately alkaline.

Turnercrest Series

The Turnercrest series consists of moderately deep, well drained soils on hills and ridges. The soils formed in residuum and eolian material derived from sandstone. Slopes range from 3 to 30 percent. Elevation is 4,100 to 5,200 feet. The average annual precipitation is 10 to 14 inches, the average annual air temperature is 45 to 49 degrees F., and the frost-free period is 105 to 130 days.

Taxonomic Class: Coarse-loamy, mixed, superactive, calcareous, mesic Ustic Torriorthents

Typical pedon of Turnercrest sandy loam, in an area of Turnercrest-Keeline-Taluce fine sandy loams, 6 to 30 percent slopes, about 900 feet south and

1,100 feet west of the northeast corner of section 7, T. 42 N., R. 73 W.

A—0 to 2 inches; brown (10YR 5/3) fine sandy loam, dark brown (10YR 4/3) moist; weak very fine granular structure; soft, very friable, nonsticky and nonplastic; many fine and very fine roots; strongly effervescent; calcium carbonate disseminated throughout; moderately alkaline; clear smooth boundary.

Bk1—2 to 7 inches; pale brown (10YR 6/3) fine sandy loam, brown (10YR 5/3) moist; weak medium subangular blocky structure; slightly hard, friable, nonsticky and nonplastic; many fine and very fine roots; strongly effervescent; calcium carbonate disseminated throughout; moderately alkaline; clear wavy boundary.

Bk2—7 to 32 inches; pale brown (10YR 6/3) fine sandy loam, brown (10YR 5/3) moist; massive; slightly hard, friable, nonsticky and nonplastic; few fine roots; slightly effervescent; calcium carbonate disseminated throughout; moderately alkaline; gradual wavy boundary.

Cr—32 to 60 inches; soft, medium and fine grained sandstone.

Depth to calcium carbonate accumulations ranges from 0 to 4 inches. Depth to bedrock ranges from 20 to 40 inches.

The A horizon texture is loamy sand, loamy fine sand, sandy loam, or fine sandy loam. Reaction is slightly alkaline or moderately alkaline.

The Bw horizon texture is sandy loam or fine sandy loam.

The C horizon texture is sandy loam, fine sandy loam, or loamy fine sand.

Note: The Turnercrest soil in map unit 150 is a taxadjunct to the Turnercrest series. The soil in this map unit is noneffervescent throughout, and reaction is slightly acid or neutral. These soils are coarse-loamy, mixed, superactive, nonacid, mesic Ustic Torriorthents.

Ucross Series

The Ucross series consists of moderately deep, well drained soils on hills and ridges. The soils formed in residuum or alluvium over residuum derived from mixed sedimentary sources. Slopes range from 0 to 30 percent. Elevation is 4,300 to 4,800 feet. The average annual precipitation is 15 to 17 inches, the average annual air temperature is 45 to 49 degrees F., and the frost-free period is 105 to 130 days.

Taxonomic Class: Fine-loamy, mixed, superactive, calcareous, mesic Aridic Ustorthents

Typical pedon of Ucross loam, in an area of Ucross-Iwait-Fairburn loams, 3 to 30 percent slopes, about 50 feet south and 25 feet west of the northeast corner section 9, T. 55 N., R. 74 W.; USGS topographic quadrangle Reservoir Creek WY; 44 degrees 45 minutes 58 seconds north latitude and 105 degrees 45 minutes 34 seconds west longitude

A—0 to 5 inches; brown (10YR 5/3) loam, brown (10YR 4/3) moist; moderate fine and medium granular structure; slightly hard, firm, nonsticky and nonplastic; many very fine and fine and common medium roots throughout; many fine pores; slightly effervescent; moderately alkaline; clear smooth boundary.

Bk1—5 to 17 inches; pale brown (10YR 6/3) clay loam, brown (10YR 5/3) moist; moderate fine and medium subangular blocky structure; slightly hard, firm, slightly sticky and slightly plastic; many very fine and fine and common medium roots throughout; many fine pores; common fine irregular light gray (10YR 7/2) carbonate threads throughout; strongly effervescent; moderately alkaline; clear smooth boundary.

Bk2—17 to 31 inches; light yellowish brown (10YR 6/4) clay loam, yellowish brown (10YR 5/4) moist; moderate fine and medium subangular blocky structure; slightly hard, firm, slightly sticky and slightly plastic; many very fine and fine roots throughout; common fine pores; common fine irregular light gray (10YR 7/2) carbonate threads throughout; strongly effervescent; strongly alkaline; abrupt wavy boundary.

Cr—31 to 60 inches; light yellowish brown (10YR 6/4) soft calcareous shale interbedded with mudstones and sandstone.

Depth to paralithic contact is 20 to 40 inches. Depth to calcium carbonate accumulations is 0 to 6 inches.

Reaction in the A horizon is neutral to moderately alkaline.

The Bk horizon texture is loam or clay loam. Reaction is slightly alkaline or moderately alkaline. Electrical conductivity ranges from 0 to 2 millimhos per centimeter. Sodium adsorption ratio is 0 to 5.

Ulm Series

The Ulm series consists of very deep, well drained soils on alluvial fans, fan remnants, hills, and ridges. The soils formed in alluvium derived from mixed

sources. Slopes range from 0 to 15 percent. Elevation is 4,100 to 5,200 feet. The average annual precipitation is 10 to 14 inches, the average annual air temperature is 45 to 49 degrees F., and the frost-free period is 105 to 130 days.

Taxonomic Class: Fine, smectitic, mesic Ustic Haplargids

Typical pedon of Ulm clay loam, 0 to 6 percent slopes, about 2,300 feet west and 2,500 feet north of the southeast corner of section 21, T. 48 N., R. 72 W.; USGS topographic quadrangle Scaper Reservoir, WY; 44 degrees 7 minutes 17 seconds north latitude and 105 degrees 30 minutes 48 seconds west longitude.

A—0 to 4 inches; grayish brown (10YR 5/2) clay loam, dark grayish brown (10YR 4/2) moist; strong fine granular structure; slightly hard, friable, sticky and plastic; many fine and few medium roots; neutral (pH 7.0); clear smooth boundary.

Bt—4 to 15 inches; brown (10YR 5/3) clay, brown (10YR 4/3) moist; strong coarse prismatic structure parting to strong medium and coarse angular blocky; very hard, very firm, very sticky and very plastic; common fine and few medium roots; many prominent clay films on faces of peds; neutral (pH 7.2); clear wavy boundary.

Btk—15 to 25 inches; brown (10YR 5/3) clay, dark brown (10YR 4/3) moist; moderate medium prismatic structure parting to strong medium angular blocky; very hard, firm, very sticky and very plastic; common fine and few medium roots; common distinct clay films on faces of peds; slightly effervescent; calcium carbonate mostly disseminated with few prominent masses; slightly alkaline (pH 7.6); clear wavy boundary.

Bk1—25 to 33 inches; pale brown (10YR 6/3) clay loam, brown (10YR 4/3) moist; moderate medium subangular blocky structure; hard, firm, sticky and plastic; few medium and fine roots; strongly effervescent; common fine seams, streaks, and masses of calcium carbonate; moderately alkaline (pH 8.2); clear wavy boundary.

Bk2—33 to 60 inches; pale brown (10YR 6/3) clay loam, brown (10YR 5/3) moist; massive; hard, firm, sticky and plastic; few fine roots; distinct seams, streaks, and masses of calcium carbonate; 5 percent partially weathered shale and soft sandstone channers; moderately alkaline (pH 8.4).

Depth to calcium carbonate accumulations ranges from 12 to 33 inches.

The A horizon texture is loam or clay loam.

The Bt and Btk horizon textures are clay, clay loam, silty clay, or silty clay loam. Reaction is neutral or slightly alkaline in the Bt horizon and slightly alkaline or moderately alkaline in the Btk horizon.

The Bk horizon texture is clay loam, loam, or silty clay loam. Electrical conductivity ranges from 0 to 2 millimhos per centimeter. Sodium adsorption ratio is 0 to 5.

Ustic Torriorthents

Ustic Torriorthents consist of shallow, moderately deep and deep, well drained and excessively drained soils on hills and ridges. The soils formed in alluvium, alluvium over residuum, or residuum derived from sandstone and shale. Slopes range from 10 to 100 percent. Elevation is 4,100 to 5,200 feet. The average annual precipitation is 10 to 17 inches, the average annual air temperature is 45 to 49 degrees, and the frost-free period is 105 to 130 days.

Taxonomic Class: Ustic Torriorthents

A—0 to 4 inches; brown (10YR 5/3) loam, brown (10YR 4/3) moist; weak fine granular structure; slightly hard, very friable, nonsticky and slightly plastic; common very fine and fine roots throughout; slightly effervescent; slightly alkaline (pH 7.8); clear smooth boundary.

Bk—4 to 35 inches; brown (10YR 5/3) clay loam, brown (10YR 4/3) moist; moderate fine and medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine and fine roots throughout; strongly effervescent; moderately alkaline (pH 8.4); abrupt smooth boundary.

Cr—35 to 60 inches; weathered shale bedrock.

Depth to paralithic contact is 4 to 30 inches in mapping unit 234. Depth to paralithic contact is 30 to 60 inches in mapping unit 233. Depth to calcium carbonate accumulations ranges from 0 to 6 inches. Rock fragments range from 0 to 10 percent. Electrical conductivity ranges from 0 to 2 millimhos per centimeter.

The A horizon texture is highly variable within short distances and commonly is fine sandy loam, loam, or clay loam. Reaction is slightly alkaline or moderately alkaline.

The Bk horizon texture is highly variable within short distances, but commonly is clay loam, loam, clay, fine sandy loam, sandy loam, or sandy clay loam. Reaction is slightly alkaline or moderately alkaline. Electrical conductivity ranges from 0 to 2 millimhos per centimeter. Sodium adsorption ratio is 0 to 5.

Valent Series

The Valent series consists of very deep, excessively drained soils on dunes. The soils formed in eolian deposits. Slopes range from 3 to 20 percent. Elevation is 4,000 to 4,500 feet. The average annual precipitation is 15 to 17 inches, the average annual air temperature is 45 to 49 degrees F., and the frost free period is 105 to 130 days.

Taxonomic Class: Mixed, mesic Aridic Ustipsamments

Typical pedon of Valent loamy sand about 2,200 feet west and 1,200 feet north of the southeast corner of section 29, T. 55 N., R. 73 W.; USGS topographic quadrangle Recluse, WY; 44 degrees 42 minutes 42 seconds north latitude and 105 degrees 40 minutes 1 second west longitude.

A—0 to 3 inches; brown (10YR 4/3) loamy fine sand, dark brown (10YR 3/3) moist; moderate thin platy structure parting to weak fine granular; soft, very friable, nonsticky and nonplastic; many fine and very fine roots throughout; common fine low continuity vesicular pores; neutral; clear smooth boundary.

C1—3 to 9 inches; brown (10YR 4/3) loamy fine sand, dark brown (10YR 3/3) moist; massive; soft, very friable, nonsticky and nonplastic; many fine and very fine roots throughout; common fine low continuity interstitial pores; noneffervescent; neutral; clear wavy boundary.

C2—9 to 23 inches; brown (10YR 5/3) loamy fine sand, brown (10YR 4/3) moist; massive; soft, very friable, nonsticky and nonplastic; many fine and very fine roots throughout; common fine low continuity interstitial pores; neutral; clear wavy boundary.

C3—23 to 60 inches; brown (10YR 5/3) loamy fine sand, brown (10YR 4/3) moist; massive; soft, very friable, nonsticky and nonplastic; common fine and very fine roots throughout; neutral.

Reaction in the A and C horizons is neutral or slightly alkaline.

Vonalee Series

The Vonalee series consists of very deep, well drained soils on alluvial fans, fan remnants, hills, and ridges. The soils formed in alluvium and eolian deposits derived from sandstone. Slopes range from 0 to 30 percent. Elevation is 4,100 to 5,200 feet. The average annual precipitation is 10 to 14 inches, the average annual air temperature is 45 to 49 degrees F., and the frost-free period is 105 to 130 days.

Taxonomic Class: Coarse-loamy, mixed, superactive, mesic Ustic Haplargids

Typical pedon of Vonalee fine sandy loam, about 600 feet east and 250 feet north of the southwest corner of section 9, T. 41 N., R. 72 W.; USGS topographic quadrangle Turnercrest SE, WY; 43 degrees 2 minutes 2 seconds north latitude and 105 degrees 1 minute 15 seconds west longitude.

A—0 to 3 inches; yellowish brown (10YR 5/4) fine sandy loam, brown (10YR 4/3) moist; weak fine granular structure; soft, very friable, nonsticky and nonplastic; many very fine and fine and common medium roots throughout; neutral; clear smooth boundary.

Bt1—3 to 12 inches; yellowish brown (10YR 5/4) fine sandy loam, brown (10YR 4/3) moist; moderate medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; many very fine and fine and common medium roots throughout; few distinct discontinuous dark brown (10YR 3/3) clay bridging between sand grains; neutral; clear smooth boundary.

Bt2—12 to 24 inches; light yellowish brown (10YR 6/4) fine sandy loam, brown (10YR 4/3) moist; moderate medium subangular blocky structure; slightly hard, very friable, nonsticky and nonplastic; many very fine and fine roots throughout; few distinct discontinuous dark brown (10YR 3/3) clay bridging between sand grains; slightly alkaline; clear smooth boundary.

Bk1—24 to 29 inches; light yellowish brown (10YR 6/4) fine sandy loam, yellowish brown (10YR 5/4) moist; weak fine subangular blocky structure; slightly hard, very friable, nonsticky and nonplastic; many very fine and fine roots throughout; carbonates are disseminated throughout; slightly effervescent; slightly alkaline; clear smooth boundary.

Bk2—29 to 60 inches; very pale brown (10YR 7/3) fine sandy loam, pale brown (10YR 6/3) moist; weak fine subangular blocky structure; slightly

hard, very friable, nonsticky and nonplastic; many very fine and fine roots throughout; common fine irregular light gray (10YR 7/2) carbonate threads throughout; strongly effervescent; moderately alkaline.

Depth to calcium carbonate accumulations ranges from 11 to 40 inches.

The A, Bt, and Bk horizon textures are fine sandy loam or sandy loam. Reaction is neutral or slightly alkaline in the A horizon, neutral to moderately alkaline in the Bt horizon, and slightly alkaline to moderately alkaline in the Bk horizon.

Vonalf Series

The Vonalf series consists of very deep, well drained soils on alluvial fans, fan remnants, hills, and ridges. The soils formed in alluvium and eolian deposits derived primarily from sandstone. Slopes range from 0 to 15 percent. Elevation is 4,300 to 4,800 feet. The average annual precipitation is 15 to 17 inches, the average annual air temperature is 45 to 49 degrees F., and the frost-free period is 105 to 130 days.

Taxonomic Class: Coarse-loamy, mixed, superactive, mesic Aridic Haplustalfs

Typical pedon of Vonalf fine sandy loam, in an area of Vonalf-Xema fine sandy loams, 3 to 10 percent slopes, about 200 feet east and 2,440 feet north of the southwest corner of section 7, T. 48 N., R. 73 W.; USGS topographic quadrangle Four Bar J Ranch, WY; 44 degrees 9 minutes 6 seconds north latitude and 105 degrees 41 minutes 18 seconds west longitude.

A—0 to 6 inches; yellowish brown (10YR 5/4) fine sandy loam, dark yellowish brown (10YR 3/4) moist; weak fine and medium subangular blocky structure parting to weak fine granular; soft, very friable, nonsticky and nonplastic; many fine and very fine roots throughout; slightly alkaline; clear smooth boundary.

Bt1—6 to 16 inches; yellowish brown (10YR 5/4) fine sandy loam, dark yellowish brown (10YR 4/4) moist; weak medium prismatic structure parting to weak medium subangular blocky; soft, very friable, slightly sticky and nonplastic; many fine and very fine roots throughout; common distinct discontinuous brown (10YR 4/3) clay bridges between sand grains; slightly alkaline (pH 7.8); clear smooth boundary.

Bt2—16 to 34 inches; yellowish brown (10YR 5/4) fine sandy loam, dark yellowish brown (10YR 4/4) moist; weak fine subangular blocky structure; soft, very friable, nonsticky and nonplastic; common very fine and fine roots throughout; few distinct discontinuous brown (10YR 4/3) clay bridges between sand grains; slightly alkaline (pH 7.8); clear smooth boundary.

Bk—34 to 60 inches; light yellowish brown (2.5Y 6/4) fine sandy loam, olive brown (2.5Y 4/4) moist; weak fine subangular blocky structure; soft, very friable, nonsticky and nonplastic; common very fine and fine roots throughout; strongly effervescent; few fine irregular light gray (10YR 7/2) carbonate threads and few fine rounded light gray (10YR 7/2) masses of carbonate throughout; moderately alkaline (pH 8.2).

Depth to calcium carbonate accumulations ranges from 14 to 40 inches.

Reaction in the A horizon is neutral or slightly alkaline.

The Bt and Bk horizon textures are fine sandy loam or sandy loam. Reaction is neutral or slightly alkaline in the Bt horizon and slightly alkaline or moderately alkaline in the Bk horizon.

Wags Series

The Wags series consists of moderately deep, well drained soils on hills and ridges. The soils formed in alluvium and residuum derived from shale. Slopes range from 3 to 30 percent. Elevation is 4,100 to 5,200 feet. The average annual precipitation is 10 to 14 inches, the average annual air temperature is 45 to 49 degree F., and the frost-free period is 105 to 130 days.

Taxonomic Class: Fine, smectitic, nonacid, mesic Ustic Torriorthents

Typical pedon of Wags clay loam, in an area of Hilight-Wags-Badland complex, 3 to 45 percent slopes, about 250 feet east and 1,050 feet north of the southwest corner of section 35, T. 44 N., R. 69 W.

A—0 to 1 inch; light brownish gray (2.5Y 6/2) clay loam, grayish brown (2.5Y 5/2) moist; weak medium subangular blocky structure; very hard, firm, sticky and plastic; common fine and very fine and few coarse and medium roots throughout; 10 percent angular shale channers; neutral (pH 6.6); abrupt smooth boundary.

C1—1 to 11 inches; light brownish gray (2.5Y 6/2) silty clay, grayish brown (2.5Y 5/2) moist; massive; extremely hard, very firm, very sticky and very plastic; common fine and very fine and few medium and coarse roots throughout; 5 percent angular shale channers; slightly acid (pH 6.4); clear wavy boundary.
C2—11 to 23 inches; light brownish gray (2.5Y 6/2) silty clay, grayish brown (2.5Y 5/2) moist; massive; very hard, firm, sticky and plastic; few medium, fine, and very fine roots throughout; 5 percent angular shale channers; slightly acid (pH 6.2); clear wavy boundary.
Cr—23 to 60 inches; grayish brown to dark gray soft nonacid shale.

Depth to bedrock ranges from 20 to 40 inches.

The A horizon texture is channery clay loam or clay. Reaction is neutral or slightly alkaline. It commonly has 5 to 35 percent selenite fragments on the soil surface.

The C horizon texture is clay or silty clay. Reaction is slightly acid to slightly alkaline. Rock fragments range from 0 to 60 percent channers. One to two percent authigenic gypsum occurs in some pedons.

Wibaux Series

The Wibaux series consists of very deep, somewhat excessively drained soils on hills and ridges. The soils formed in alluvium and/or eolian deposits or residuum derived from porcelanite. Slopes range from 0 to 60 percent. Elevation is 4,100 to 5,200 feet. The average annual precipitation is 10 to 14 inches, the average annual air temperature is 45 to 49 degrees F., and the frost-free period is 105 to 130 days.

Taxonomic Class: Loamy-skeletal over fragmental, mixed, superactive, nonacid, mesic Ustic Torriorthents

Typical pedon of Wibaux channery fine sandy loam, in an area of Wibaux, thick solum-Wibaux channery fine sandy loams, 3 to 40 percent slopes, about 1,600 feet west and 150 feet south of the northeast corner of section 14, T. 41 N., R. 70 W.; USGS topographic quadrangle Piney Canyon SW, WY; 43 degrees 32 minutes 3 seconds north latitude and 105 degrees 12 minutes 42 seconds west longitude.

A—0 to 3 inches; reddish brown (5YR 5/4) channery fine sandy loam, reddish brown (5YR 4/4) moist; weak fine granular structure; soft, very friable, nonsticky and nonplastic; 25 percent angular porcelanite channers; slightly alkaline; clear wavy boundary.
C—3 to 16 inches; reddish brown (5YR 5/4) very channery loam, reddish brown (5YR 4/4) moist; massive; soft, friable, slightly sticky and slightly plastic; 55 percent angular porcelanite channers; slightly alkaline; clear wavy boundary
2C—16 to 60 inches; fractured porcelanite.

The soil is noneffervescent in the A horizon but may be weakly effervescent in the 2C horizon in some pedons. Depth to fragmental material ranges from 7 to 20 inches.

The A horizon texture is channery fine sandy loam, channery loam, or very channery loam. Reaction is neutral or slightly alkaline.

The C horizon texture is very channery loam, extremely channery loam, very channery sandy clay loam, or extremely channery sandy clay loam. Reaction is neutral or slightly alkaline.

The 2C horizon consists of fractured porcelanite material. It has 0 to 5 percent fine earth material between fractures. This horizon is 50 to 85 percent channers, 15 to 45 percent flagstones, and 0 to 5 percent stones.

Note: The Wibaux, thick solum, soils in map unit 243 are taxadjuncts to the Wibaux series. These soils have pedogenic accumulations of 1 to 5 percent calcium carbonate in some horizons above the porcelanite. Depth to fragmental material ranges from 20 to 40 inches.

The Bk horizon texture is very channery sandy loam, very channery fine sandy loam, or very channery loam. Reaction is moderately alkaline. These soils are loamy-skeletal over fragmental, mixed, superactive, nonacid, mesic Ustic Torriorthents.

Worf Series

The Worf series consists of shallow, well drained soils on hills and ridges. The soils formed in residuum derived from interbedded sandstone and shale. Slopes range from 3 to 30 percent. Elevation is 4,100 to 5,200 feet. The average annual precipitation is 10 to 14 inches, the average annual air temperature is 45 to 49 degrees F., and the frost-free period is 105 to 130 days.

Taxonomic Class: Loamy, mixed, superactive, mesic, shallow Ustic Haplargids

Typical pedon of Worf loam, in an area of Cushman-Worf loams, 3 to 15 percent slopes, about 300 feet west and 2,380 feet south of the northeast corner of section 25, T. 46 N., R. 76 W.

A—0 to 2 inches; brown (10YR 5/3) loam, dark brown (10YR 4/3) moist; weak fine granular structure; soft, very friable, slightly sticky and slightly plastic; many fine and very fine roots; neutral; clear smooth boundary.

Bt—2 to 10 inches; light yellowish brown (10YR 6/4) loam, yellowish brown (10YR 5/4) moist; moderate medium subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; many fine and very fine roots; common distinct clay films on faces of peds; slightly alkaline; clear smooth boundary.

Bk—10 to 18 inches; light yellowish brown (2.5Y 6/4) loam, light olive brown (2.5Y 5/4) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; common fine and few very fine roots; strongly effervescent; calcium carbonate disseminated throughout; moderately alkaline; clear smooth boundary.

Cr—18 to 60 inches; soft, effervescent sandy shale.

Depth to calcium carbonate accumulations ranges from 5 to 12 inches. Depth to bedrock ranges from 10 to 20 inches. Rock fragments range from 0 to 10 percent.

The A horizon texture is sandy loam or loam. Reaction is neutral or slightly alkaline.

The Bt horizon texture is loam, sandy clay loam, or clay loam. Reaction is neutral or slightly alkaline.

The Bk horizon texture is loam, sandy clay loam, or clay loam. Electrical conductivity ranges from 0 to 2 millimhos per centimeter. Sodium adsorption ratio is 0 to 5.

Worfka Series

The Worfka series consists of shallow, well drained soils on hills and ridges. The soils formed in alluvium and residuum from shale or interbedded shale and sandstone. Slopes range from 3 to 15 percent. Elevation is 4,100 to 5,000 feet. The average annual precipitation is 10 to 14 inches, the average annual air temperature is 45 to 49 degrees F., and the frost-free period is 105 to 130 days.

Taxonomic Class: Clayey, smectitic, mesic, shallow Ustic Haplargids

Typical pedon of Worfka clay loam, in an area of Renohill-Worfka clay loams, 3 to 15 percent slopes, about 1,700 feet east and 2,490 feet north of the southwest corner of section 5, T. 48 N., R. 70 W.; USGS topographic quadrangle Coyote Draw, WY; 44 degrees 10 minutes 2 seconds north latitude and 105 degrees 20 minutes 8 seconds west longitude.

A—0 to 2 inches; light brownish gray (10YR 6/2) clay loam, dark grayish brown (10YR 4/2) moist; moderate very fine granular structure; hard, friable, sticky and plastic; many fine and very fine roots; neutral (pH 7.2); clear smooth boundary.

Bt—2 to 7 inches; grayish brown (10YR 5/2) clay loam, dark grayish brown (10YR 4/2) moist; moderate medium angular blocky structure parting to moderate fine angular blocky; very hard, firm, sticky and plastic; many fine and very fine roots; many prominent clay films on faces of peds; slightly alkaline (pH 7.4); clear smooth boundary.

Btk—7 to 13 inches; pale brown (10YR 6/3) clay loam, brown (10YR 5/3) moist; strong medium angular blocky structure; very hard, firm, sticky and plastic; common fine and medium roots; few distinct clay films on faces of peds; strongly effervescent; calcium carbonate as few masses; moderately alkaline (pH 8.2); clear smooth boundary.

Bk—13 to 19 inches; light brownish gray (10YR 6/2) clay loam, grayish brown (10YR 5/2) moist; moderate coarse subangular blocky structure; very hard, firm, sticky and plastic; violently effervescent; calcium carbonate as common medium masses; moderately alkaline (pH 8.4); clear wavy boundary.

Cr—19 to 60 inches; soft calcareous shale.

Depth to accumulations of calcium carbonate ranges from 5 to 9 inches. Depth to bedrock ranges from 10 to 20 inches. Rock fragments range from 0 to 10 percent.

Reaction in the A horizon is neutral or slightly alkaline.

The Bt and Btk horizons textures are clay loam or clay.

Electrical conductivity in the Bk horizon ranges from 0 to 2 millimhos per centimeter. Sodium adsorption ratio is 0 to 5.

Wyarno Series

The Wyarno series consists of very deep, well drained soils on alluvial fans and fan remnants. The soils formed in alluvium derived from shale. Slopes range from 0 to 6 percent. Elevation is 4,100 to 5,200 feet. The average annual precipitation is 10 to 14

inches, the average annual air temperature is 45 to 49 degrees F., and the frost-free period is 105 to 130 days.

Taxonomic Class: Fine, smectitic, mesic Ustic Haplargids

Typical pedon of Wyarno clay loam, in an area of Wyarno-Ulm clay loams, 0 to 6 percent slopes, about 1,600 feet east and 1,400 feet south of the northwest corner of section 17, T. 42 N., R. 72 W.

A—0 to 3 inches; pale brown (10YR 6/3) clay loam, dark brown (10YR 3/3) moist; moderate medium granular structure; slightly hard, friable, slightly sticky and slightly plastic; neutral; clear smooth boundary.

Bt—3 to 8 inches; brown (10YR 5/3) clay, brown (10YR 4/3) moist; strong medium and coarse prismatic structure parting to strong medium and coarse angular blocky; hard, friable, moderately sticky and moderately plastic; few distinct discontinuous dark brown (10YR 3/3) clay films on faces of peds and in pores; slightly alkaline; clear smooth boundary.

Btk—8 to 12 inches; pale brown (10YR 6/3) clay loam, brown (10YR 5/3) moist; strong medium and coarse prismatic structure parting to strong medium and coarse angular blocky; hard, firm, moderately sticky and moderately plastic; few distinct discontinuous dark brown (10YR 3/3) clay films on faces of peds and in pores; common fine irregular light gray (10YR 7/2) carbonate threads throughout; slightly effervescent; moderately alkaline; clear smooth boundary.

Bk1—12 to 33 inches; pale brown (10YR 6/3) clay loam, brown (10YR 5/3) moist; strong medium angular blocky structure; hard, firm, moderately sticky and moderately plastic; common fine irregular light gray (10YR 7/2) carbonate threads throughout; strongly effervescent; moderately alkaline; clear smooth boundary.

Bk2—33 to 60 inches; brown (10YR 5/3) clay loam, brown (10YR 4/3) moist; strong medium angular blocky structure; hard, friable, moderately sticky and moderately plastic; common fine irregular light gray (10YR 7/2) carbonate threads throughout; strongly effervescent; moderately alkaline.

Depth to accumulations of calcium carbonate ranges from 6 to 9 inches.

The Bt and Btk horizon textures are clay loam or clay.

Electrical conductivity in the Bk horizon ranges from 0 to 2 millimhos per centimeter. Sodium adsorption ratio is 0 to 5.

Wyotite Series

The Wyotite series consists of very deep, well drained soils on alluvial fans and fan remnants. The soils formed in alluvium and eolian deposits derived from mixed sources. Slopes range from 0 to 6 percent. Elevation is 4,100 to 5,200 feet. The average annual precipitation is 10 to 14 inches, the average annual air temperature is 45 to 49 degrees F., and the frost-free period is 105 to 130 days.

Taxonomic Class: Fine-silty, mixed, superactive, mesic Ustic Haplargids

Typical pedon of Wyotite loam, in an area of Wyotite-Ulm loams, 0 to 6 percent slopes, about 250 feet south and 250 feet east of the northwest corner of section 33, T. 43 N., R. 75 W.; USGS topographic quadrangle Rolling Pin Ranch, WY; 43 degrees 39 minutes 45 seconds north latitude and 105 degrees 53 minutes 9 seconds west longitude

A—0 to 2 inches; brown (10YR 5/3) loam, dark brown (10YR 3/3) moist; weak fine and moderate very fine granular structure; soft, very friable, nonsticky and nonplastic; many very fine and fine roots; slightly acid (pH 6.2); abrupt smooth boundary.

Bt1—2 to 5 inches; pale brown (10YR 6/3) clay loam, brown (10YR 4/3) moist; moderate medium platy structure parting to weak medium subangular blocky; slightly hard, friable, sticky and plastic; many very fine and fine roots; common faint clay films on faces of peds; slightly acid (pH 6.4); clear wavy boundary.

Bt2—5 to 13 inches; light yellowish brown (10YR 6/4) clay loam, dark yellowish brown (10YR 4/4) moist; moderate medium prismatic structure parting to strong medium and fine angular blocky; hard, friable, sticky and plastic; common fine and many very fine roots; many prominent and common distinct clay films on faces of peds; neutral (pH 6.6); abrupt wavy boundary.

Btk—13 to 22 inches; light brownish gray (2.5Y 6/2) silty clay loam, olive brown (2.5Y 4/4) moist; moderate medium prismatic structure parting to moderate medium subangular blocky; hard, friable, sticky and plastic; common fine and very fine roots; many faint and few prominent clay films on faces of peds; strongly effervescent; common medium and fine masses of calcium carbonate; slightly alkaline (pH 7.6); clear wavy boundary.

Bk1—22 to 38 inches; pale yellow (2.5Y 7/4) silty clay loam, light olive brown (2.5Y 5/4) moist; weak coarse subangular blocky structure; slightly hard,

friable, slightly sticky and plastic; few fine roots; strongly effervescent; common medium and fine seams and masses of calcium carbonate; moderately alkaline (pH 8.0); clear wavy boundary.

Bk2—38 to 55 inches; light yellowish brown (2.5Y 6/4) loam, light olive brown (2.5Y 5/4) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; few fine roots; strongly effervescent; few fine filaments, threads, and masses of calcium carbonate; moderately alkaline (pH 8.4); gradual wavy boundary.

C—55 to 60 inches; light yellowish brown (2.5Y 6/4) loam, olive brown (2.5Y 4/4) moist; massive; soft friable, slightly sticky and nonplastic; strongly effervescent; calcium carbonate disseminated; strongly alkaline (pH 8.6).

Depth to calcium carbonate accumulations ranges from 10 to 20 inches, but the soils may be slightly effervescent from 0 to 5 inches in some pedons that receive intermittent recharge of calcium carbonate.

The Bt and Btk horizon textures are silty clay loam or clay loam. Reaction is slightly acid or neutral in the Bt horizon.

The Bk horizon texture is loam, silt loam, or silty clay loam. Electrical conductivity ranges from 0 to 2 millimhos per centimeter. Sodium adsorption ratio is 0 to 5.

Xema Series

The Xema series consists of moderately deep, well drained soils on hills and ridges. The soils formed in eolian deposits or alluvium over residuum derived primarily from sandstone. Slopes range from 3 to 30 percent. Elevation is 4,300 to 4,800 feet. The average annual precipitation is 15 to 17 inches, the average annual air temperature is 45 to 49 degrees F., and the frost-free period is 105 to 130 days.

Taxonomic Class: Coarse-loamy, mixed, superactive, mesic Aridic Haplustalfs

Typical pedon of Xema fine sandy loam, about 300 feet east and 2,350 feet north of the southwest corner of section 26, T. 55 N., R. 69 W.; USGS topographic quadrangle Brislawn School, WY; 44 degrees 43 minutes 14 seconds north latitude and 105 degrees 7 minutes 28 seconds west longitude

A—0 to 4 inches; brown (10YR 5/3) fine sandy loam, brown (10YR 4/3) moist; weak fine angular blocky structure parting to weak thin platy; soft, very friable, nonsticky and nonplastic; many very fine and fine and common medium roots throughout; many fine low continuity vesicular and tubular pores; neutral; clear smooth boundary.

Bt1—4 to 13 inches; brown (10YR 5/3) fine sandy loam, brown (10YR 4/3) moist; weak medium prismatic structure parting to weak fine angular blocky; soft, very friable, nonsticky and nonplastic; many very fine and fine roots throughout; many fine low continuity vesicular and tubular pores; common distinct continuous dark brown (10YR 3/3) clay bridging between sand grains; neutral; clear wavy boundary.

Bt2—13 to 22 inches; yellowish brown (10YR 5/4) fine sandy loam, dark yellowish brown (10YR 4/4) moist; weak fine and medium angular blocky structure; soft, very friable, nonsticky and nonplastic; many very fine and fine roots throughout; many fine low continuity vesicular and tubular pores; few distinct discontinuous dark yellowish brown (10YR 3/4) clay bridging between sand grains; slightly alkaline; clear wavy boundary.

Bk—22 to 31 inches; yellowish brown (10YR 5/4) fine sandy loam, dark yellowish brown (10YR 4/4) moist; weak fine and medium angular blocky structure parting to weak fine granular; soft, very friable, nonsticky and nonplastic; many fine and very fine roots throughout; common fine low continuity vesicular and tubular pores; slightly effervescent; carbonates are disseminated throughout; moderately alkaline; clear wavy boundary.

Cr—31 to 60 inches; soft calcareous sandstone; slightly effervescent; moderately alkaline.

Depth to bedrock ranges from 20 to 40 inches. Depth to calcium carbonate accumulations ranges from 12 to 40 inches.

The Bt and Bk horizon textures are fine sandy loam or sandy loam. Reaction is neutral to slightly alkaline in the Bt horizon.

Ziggy Series

The Ziggy series consists of very deep, well drained soils on alluvial fans, fan remnants, hills, and ridges. The soils formed in alluvium derived from mixed sedimentary sources. Slopes range from 0 to 15 percent. Elevation is 4,300 to 4,800 feet. The average annual precipitation is 15 to 17 inches, the

average annual air temperature is 45 to 49 degrees F., and the frost-free period is 105 to 130 days.

Taxonomic Class: Fine-loamy, mixed, superactive, mesic Aridic Haplustepts

Typical pedon of Ziggy loam, in an area of Ziggy-Iwait loams, 0 to 6 percent slopes, about 350 feet south and 1,300 feet west of the northeast corner of section 28, T. 50 N., R. 74 W.; USGS topographic quadrangle Jeffers Draw, WY; 44 degrees 17 minutes 13 seconds north latitude and 105 degrees 45 minutes 27 seconds west longitude

A—0 to 5 inches; brown (10YR 5/3) loam, dark brown (10YR 4/3) moist; weak fine platy structure parting to weak fine granular; soft, friable, nonsticky and slightly plastic; many fine and very fine roots; neutral; abrupt smooth boundary.

Bw—5 to 14 inches; brown (10YR 5/3) loam, dark brown (10YR 4/3) moist; weak medium prismatic structure parting to moderate medium and fine subangular blocky; slightly hard, friable, slightly sticky and plastic; common fine and very fine roots; slightly effervescent; calcium carbonate disseminated; slightly alkaline; clear smooth boundary.

Bk1—14 to 32 inches; pale brown (10YR 6/3) clay loam, brown (10YR 5/3) moist; weak medium prismatic structure parting to moderate medium subangular blocky; slightly hard, friable, sticky and plastic; common fine and very fine roots; strongly effervescent; common fine irregularly shaped filaments and masses of calcium carbonate; moderately alkaline; clear wavy boundary.

Bk2—32 to 60 inches; pale brown (10YR 6/3) clay loam, brown (10YR 5/3) moist; moderate medium subangular blocky structure; hard, friable, sticky and plastic; few fine and very fine roots; strongly effervescent; many fine irregularly shaped filaments and common fine rounded masses of calcium carbonate; moderately alkaline.

Depth to calcium carbonate accumulations ranges from 0 to 8 inches.

Reaction in the A horizon is neutral or slightly alkaline.

The Bw and Bk horizon textures are loam or clay loam. Reaction is slightly alkaline or moderately alkaline in the Bw horizon. In the Bk horizon, electrical conductivity ranges from 0 to 2 millimhos per centimeter and the sodium adsorption ratio is 0 to 5.

Zigweid Series

The Zigweid series consists of very deep, well drained soils on alluvial fans, fan remnants, hills, and ridges. The soils formed in alluvium derived from mixed sources. Slopes range from 0 to 15 percent. Elevation is 4,100 to 5,200 feet. The average annual precipitation is 10 to 14 inches, the average annual air temperature is 45 to 49 degrees F., and the frost-free period is 105 to 130 days.

Taxonomic Class: Fine-loamy, mixed, superactive, mesic Ustic Haplocambids

Typical pedon of Zigweid loam, in an area of Cambria-Kishona-Zigweid loams, 0 to 6 percent slopes, about 400 feet south and 1,200 feet west of the northeast corner of section 17, T. 45 N., R. 73 W.

A—0 to 2 inches; brown (10YR 5/3) loam, dark brown (10YR 4/3) moist; weak medium and moderate fine granular structure; soft, friable, slightly sticky and slightly plastic; many fine and very fine roots; slightly alkaline; clear wavy boundary.

Bw—2 to 13 inches; pale brown (10YR 6/3) clay loam, brown (10YR 5/3) moist; weak medium prismatic structure parting to moderate medium subangular blocky; hard, friable, sticky and plastic; common fine and very fine roots; slightly effervescent; calcium carbonate disseminated; moderately alkaline; clear wavy boundary.

Bk1—13 to 23 inches; pale brown (10YR 6/3) clay loam, brown (10YR 5/3) moist; weak medium prismatic structure parting to weak medium and fine subangular blocky; hard, firm, sticky and plastic; common fine and very fine roots; strongly effervescent; few fine threads and masses of calcium carbonate; moderately alkaline; clear wavy boundary.

Bk2—23 to 60 inches; light brownish gray (2.5Y 6/2) clay loam, light olive brown (2.5Y 5/4) moist; weak coarse and medium subangular blocky structure; slightly hard, friable, slightly sticky and plastic; strongly effervescent; few fine threads and masses of calcium carbonate; moderately alkaline.

Depth to accumulations of calcium carbonate ranges from 0 to 8 inches.

The Bw and Bk horizon textures are loam or clay loam. In the Bk horizon, electrical conductivity ranges from 0 to 2 millimhos per centimeter and the sodium adsorption ratio is 0 to 5.

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Glossary

ABC soil. A soil having an A, a B, and a C horizon.

AC soil. A soil having only an A and a C horizon. Commonly, such soil formed in recent alluvium or on steep, rocky slopes.

Aeration, soil. The exchange of air in soil with air from the atmosphere. The air in a well aerated soil is similar to that in the atmosphere; the air in a poorly aerated soil is considerably higher in carbon dioxide and lower in oxygen.

Aggregate, soil. Many fine particles held in a single mass or cluster. Natural soil aggregates, such as granules, blocks, or prisms, are called peds. Clods are aggregates produced by tillage or logging.

Alkali (sodic) soil. A soil having so high a degree of alkalinity (pH 8.5 or higher) or so high a percentage of exchangeable sodium (15 percent or more of the total exchangeable bases), or both, that plant growth is restricted.

Alluvial fan. The fanlike deposit of a stream where it issues from a gorge upon a plain or of a tributary stream near or at its junction with its main stream.

Alluvium. Material, such as sand, silt, or clay, deposited on land by streams.

Alpha,alpha-dipyridyl. A dye that when dissolved in 1N ammonium acetate is used to detect the presence of reduced iron (Fe II) in the soil. A positive reaction indicates a type of redoximorphic feature.

Animal unit month (AUM). The amount of forage required by one mature cow of approximately 1,000 pounds weight, with or without a calf, for 1 month.

Aquic conditions. Current soil wetness characterized by saturation, reduction, and redoximorphic features.

Area reclaim (in tables). An area difficult to reclaim after the removal of soil for construction and other uses. Revegetation and erosion control are extremely difficult.

Argillic horizon. A genetically developed horizon of significant clay accumulation, situated below the surface layer in a soil profile. It is that part of the subsoil referred to as the Bt and, in some profiles, the Btk horizon.

Aspect. The direction in which a slope faces.

Association, soil. A group of soils or miscellaneous areas geographically associated in a characteristic repeating pattern and defined and delineated as a single map unit.

Authigenic. The accumulation of salts in a soil horizon which are derived primarily from the parent material and which formed in place.

Available water capacity (available moisture capacity). The capacity of soils to hold water available for use by most plants. It is commonly defined as the difference between the amount of soil water at field moisture capacity and the amount at wilting point. It is commonly expressed as inches of water per inch of soil. The capacity, in inches, in a 60-inch profile or to a limiting layer is expressed as:

Very low	0 to 3.5
Low	3.5 to 5.0
Moderate	5.0 to 7.5
High	more than 7.5

Backslope. The position that forms the steepest and generally linear, middle portion of a hillslope. In profile, backslopes are commonly bounded by a convex shoulder above and a concave footslope below.

Badland. Steep or very steep, commonly nonstony, barren land dissected by many intermittent drainage channels. Badland is most common in semiarid and arid regions where streams are entrenched in soft geologic material. Local relief generally ranges from 25 to 500 feet. Runoff potential is very high, and geologic erosion is active.

Base saturation. The degree to which material having cation-exchange properties is saturated with exchangeable bases (sum of Ca, Mg, Na, and K), expressed as a percentage of the total cation-exchange capacity.

Base slope. A geomorphic component of hills consisting of the concave to linear (perpendicular to the contour) slope that, regardless of the lateral shape, forms an apron or wedge at the bottom of a hillside dominated by colluvium and slope-wash sediments (for example, slope alluvium).

Bedding planes. Fine strata, less than 5 millimeters thick, in unconsolidated alluvial, eolian, lacustrine, or marine sediment.

Bedding system. A drainage system made by plowing, grading, or otherwise shaping the surface of a flat field. It consists of a series of low ridges separated by shallow, parallel dead furrows.

Bedrock. The solid rock that underlies the soil and other unconsolidated material or that is exposed at the surface.

Bedrock-controlled topography. A landscape where the configuration and relief of the landforms are determined or strongly influenced by the underlying bedrock.

Bisequum. Two sequences of soil horizons, each of which consists of an illuvial horizon and the overlying eluvial horizons.

Blowout. A shallow depression from which all or most of the soil material has been removed by the wind. A blowout has a flat or irregular floor formed by a resistant layer or by an accumulation of pebbles or cobbles. In some blowouts the water table is exposed.

Bottom land. The normal flood plain of a stream, subject to flooding.

Breaks. The steep and very steep broken land at the border of an upland summit that is dissected by ravines.

Brush management. Use of mechanical, chemical, or biological methods to make conditions favorable for reseeding or to reduce or eliminate competition from woody vegetation and thus allow understory grasses and forbs to recover. Brush management increases forage production and thus reduces the hazard of erosion. It can improve the habitat for some species of wildlife.

Butte. An isolated small mountain or hill with steep or precipitous sides and a top variously flat, rounded, or pointed that may be a residual mass isolated by erosion or an exposed volcanic neck.

Calcareous soil. A soil containing enough calcium carbonate (commonly combined with magnesium carbonate) to effervesce visibly when treated with cold, dilute hydrochloric acid.

Cambic horizon. A structural horizon below the surface layer which does not have the clay accumulation necessary for an argillic horizon. It is that part of the subsoil referred to as the Bw horizon.

Canopy. The leafy crown of trees or shrubs. (See Crown.)

Capillary water. Water held as a film around soil particles and in tiny spaces between particles. Surface tension is the adhesive force that holds capillary water in the soil.

Cation. An ion carrying a positive charge of electricity. The common soil cations are calcium, potassium, magnesium, sodium, and hydrogen.

Cation-exchange capacity. The total amount of exchangeable cations that can be held by the soil, expressed in terms of milliequivalents per 100 grams of soil at neutrality (pH 7.0) or at some other stated pH value. The term, as applied to soils, is synonymous with base-exchange capacity but is more precise in meaning.

Channery soil material. Soil material that has, by volume, 15 to 35 percent thin, flat fragments of sandstone, shale, slate, limestone, or schist as much as 6 inches (15 centimeters) along the longest axis. A single piece is called a channer.

Chemical treatment. Control of unwanted vegetation through the use of chemicals.

Chiseling. Tillage with an implement having one or more soil-penetrating points that shatter or loosen hard, compacted layers to a depth below normal plow depth.

Clay. As a soil separate, the mineral soil particles less than 0.002 millimeter in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

Clay depletions. Low-chroma zones having a low content of iron, manganese, and clay because of the chemical reduction of iron and manganese and the removal of iron, manganese, and clay. A type of redoximorphic depletion.

Clay film. A thin coating of oriented clay on the surface of a soil aggregate or lining pores or root channels. Synonyms: clay coating, clay skin.

Claypan. A slowly permeable soil horizon that contains much more clay than the horizons above it. A claypan is commonly hard when dry and plastic or stiff when wet.

Climax plant community. The stabilized plant community on a particular site. The plant cover reproduces itself and does not change so long as the environment remains the same.

Coarse textured soil. Sand or loamy sand.

Cobble (or cobblestone). A rounded or partly rounded fragment of rock 3 to 10 inches (7.6 to 25 centimeters) in diameter.

Colluvium. Soil material or rock fragments, or both, moved by creep, slide, or local wash and deposited at the base of steep slopes.

Complex slope. Irregular or variable slope. Planning or establishing terraces, diversions, and other water-control structures on a complex slope is difficult.

Complex, soil. A map unit of two or more kinds of soil or miscellaneous areas in such an intricate pattern or so small in area that it is not practical to map them separately at the selected scale of mapping. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas.

Compressible (in tables). Excessive decrease in volume of soft soil under load.

Concretions. Cemented bodies with crude internal symmetry organized around a point, a line, or a plane. They typically take the form of concentric layers visible to the naked eye. Calcium carbonate, iron oxide, and manganese oxide are common compounds making up concretions. If formed in place, concretions of iron oxide or manganese oxide are generally considered a type of redoximorphic concentration.

Conservation cropping system. Growing crops in combination with needed cultural and management practices. In a good conservation cropping system, the soil-improving crops and practices more than offset the effects of the soil-depleting crops and practices. Cropping systems are needed on all tilled soils. Soil-improving practices in a conservation cropping system include the use of rotations that contain grasses and legumes and the return of crop residue to the soil. Other practices include the use of green manure crops of grasses and legumes, proper tillage, adequate fertilization, and weed and pest control.

Conservation tillage. A tillage system that does not invert the soil and that leaves a protective amount of crop residue on the surface throughout the year.

Consistence, soil. Refers to the degree of cohesion and adhesion of soil material and its resistance to deformation when ruptured. Consistence includes resistance of soil material to rupture and to penetration; plasticity, toughness, and stickiness of puddled soil material; and the manner in which the soil material behaves when subject to compression. Terms describing consistence are defined in the "Soil Survey Manual."

Contour stripcropping. Growing crops in strips that follow the contour. Strips of grass or close-growing crops are alternated with strips of clean-tilled crops or summer fallow.

Control section. The part of the soil on which classification is based. The thickness varies among different kinds of soil, but for many it is that part of the soil profile between depths of 10 inches and 40 inches.

Corrosion. Soil-induced electrochemical or chemical action that dissolves or weakens concrete or uncoated steel.

Cover crop. A close-growing crop grown primarily to improve and protect the soil between periods of regular crop production, or a crop grown between trees and vines in orchards and vineyards.

Cretaceous age. The period of the Cenozoic Era of geologic time from approximately 100 million to 65 million years ago.

Cropping system. Growing crops according to a planned system of rotation and management practices.

Crop residue management. Returning crop residue to the soil, which helps to maintain soil structure, organic matter content, and fertility and helps to control erosion.

Crown. The upper part of a tree or shrub, including the living branches and their foliage.

Cutbanks cave (in tables). The walls of excavations tend to cave in or slough.

Decreasers. The most heavily grazed climax range plants. Because they are the most palatable, they are the first to be destroyed by overgrazing.

Deferred grazing. Postponing grazing or resting grazing land for a prescribed period.

Dense layer (in tables). A very firm, massive layer that has a bulk density of more than 1.8 grams per cubic centimeter. Such a layer affects the ease of digging and can affect filling and compacting.

Depth, soil. Generally, the thickness of the soil over bedrock. Very deep soils are more than 60 inches deep over bedrock; deep soils, 40 to 60 inches; moderately deep, 20 to 40 inches; shallow, 10 to 20 inches; and very shallow, less than 10 inches.

Depth to rock (in tables). Bedrock is too near the surface for the specified use.

Diversion (or diversion terrace). A ridge of earth, generally a terrace, built to protect downslope areas by diverting runoff from its natural course.

Drainage class (natural). Refers to the frequency and duration of wet periods under conditions similar to those under which the soil formed. Alterations of the water regime by human activities, either through drainage or irrigation, are not a consideration unless they have significantly changed the morphology of the soil. Seven classes of natural soil drainage are recognized—*excessively drained, somewhat excessively drained, well drained, moderately well drained, somewhat poorly drained, poorly drained,* and *very poorly drained.* These classes are defined in the "Soil Survey Manual."

Drainage, surface. Runoff, or surface flow of water, from an area.

Draw. A small stream valley that generally is more open and has broader bottom land than a ravine or gulch.

Duff. A generally firm organic layer on the surface of mineral soils. It consists of fallen plant material that is in the process of decomposition and includes everything from the litter on the surface to underlying pure humus.

Dune. A mound, ridge, or hill of loose, windblown granular material (generally sand), either bare or covered with vegetation.

Eluviation. The movement of material in true solution or colloidal suspension from one place to another within the soil. Soil horizons that have lost material through eluviation are eluvial; those that have received material are illuvial.

Endosaturation. A type of saturation of the soil in which all horizons between the upper boundary of saturation and a depth of 2 meters are saturated.

Eolian soil material. Earthy parent material accumulated through wind action; commonly refers to sandy material in dunes or to loess in blankets on the surface.

Ephemeral stream. A stream, or reach of a stream, that flows only in direct response to precipitation. It receives no long-continued supply from melting snow or other source, and its channel is above the water table at all times.

Episaturation. A type of saturation indicating a perched water table in a soil in which saturated layers are underlain by one or more unsaturated layers within 2 meters of the surface.

Erosion. The wearing away of the land surface by water, wind, ice, or other geologic agents and by such processes as gravitational creep.

Erosion (geologic). Erosion caused by geologic processes acting over long geologic periods and resulting in the wearing away of mountains and the building up of such landscape features as flood plains and coastal plains. Synonym: natural erosion.

Erosion (accelerated). Erosion much more rapid than geologic erosion, mainly as a result of human or animal activities or of a catastrophe in nature, such as a fire, that exposes the surface.

Escarpment. A relatively continuous and steep slope or cliff breaking the general continuity of more gently sloping land surfaces and resulting from erosion or faulting. Synonym: scarp.

Excess fines (in tables). Excess silt and clay in the soil. The soil does not provide a source of gravel or sand for construction purposes.

Excess lime (in tables). Excess carbonates in the soil that restrict the growth of some plants.

Excess salts (in tables). Excess water-soluble salts in the soil that restrict the growth of most plants.

Excess sodium (in tables). Excess exchangeable sodium in the soil. The resulting poor physical properties restrict the growth of plants.

Fallow. Cropland left idle in order to restore productivity through accumulation of moisture. Summer fallow is common in regions of limited rainfall where cereal grain is grown. The soil is tilled for at least one growing season for weed control and decomposition of plant residue.

Fan remnant. A relict alluvial fan, no longer a site of active deposition, incised by younger and lower alluvial surfaces.

Fast intake (in tables). The rapid movement of water into the soil.

Fertility, soil. The quality that enables a soil to provide plant nutrients, in adequate amounts and in proper balance, for the growth of specified plants when light, moisture, temperature, tilth, and other growth factors are favorable.

Field moisture capacity. The moisture content of a soil, expressed as a percentage of the ovendry weight, after the gravitational, or free, water has drained away; the field moisture content 2 or 3 days after a soaking rain; also called *normal field*

capacity, normal moisture capacity, or *capillary capacity.*

Fill slope. A sloping surface consisting of excavated soil material from a road cut. It commonly is on the downhill side of the road.

Fine textured soil. Sandy clay, silty clay, or clay.

Flagstone. A thin fragment of sandstone, slate or shale 6 to 15 inches (15 to 38 centimeters) long.

Flood plain. A nearly level alluvial plain that borders a stream and is subject to flooding unless protected artificially.

Footslope. The position that forms the inner, gently inclined surface at the base of a hillslope. In profile, footslopes are commonly concave. A footslope is a transition zone between upslope sites of erosion and transport (shoulders and backslopes) and downslope sites of deposition (toeslopes).

Forb. Any herbaceous plant not a grass or a sedge.

Fragile (in tables). A soil that is easily damaged by use or disturbance.

Frost action (in tables). Freezing and thawing of soil moisture. Frost action can damage roads, buildings and other structures, and plant roots.

Genesis, soil. The mode of origin of the soil. Refers especially to the processes or soil-forming factors responsible for the formation of the solum, or true soil, from the unconsolidated parent material.

Gleyed soil. Soil that formed under poor drainage, resulting in the reduction of iron and other elements in the profile and in gray colors.

Grassed waterway. A natural or constructed waterway, typically broad and shallow, seeded to grass as protection against erosion. Conducts surface water away from cropland.

Gravel. Rounded or angular fragments of rock as much as 3 inches (2 millimeters to 7.6 centimeters) in diameter. An individual piece is a pebble.

Gravelly soil material. Material that has 15 to 35 percent, by volume, rounded or angular rock fragments, not prominently flattened, as much as 3 inches (7.6 centimeters) in diameter.

Green manure crop (agronomy). A soil-improving crop grown to be plowed under in an early stage of maturity or soon after maturity.

Ground water. Water filling all the unblocked pores of the material below the water table.

Gully. A miniature valley with steep sides cut by running water and through which water ordinarily runs only after rainfall. The distinction between a gully and a rill is one of depth. A gully generally is an obstacle to farm machinery and is too deep to be obliterated by ordinary tillage; a rill is of lesser depth and can be smoothed over by ordinary tillage.

Hard bedrock. Bedrock that cannot be excavated except by blasting or by the use of special equipment that is not commonly used in construction.

Head slope. A geomorphic component of hills consisting of a laterally concave area of a hillside, especially at the head of a drainageway. The overland waterflow is converging.

High-residue crops. Such crops as small grain and corn used for grain. If properly managed, residue from these crops can be used to control erosion until the next crop in the rotation is established. These crops return large amounts of organic matter to the soil.

Hill. A natural elevation of the land surface, rising as much as 1,000 feet above surrounding lowlands, commonly of limited summit area and having a well defined outline; hillsides generally have slopes of more than 15 percent. The distinction between a hill and a mountain is arbitrary and is dependent on local usage.

Horizon, soil. A layer of soil, approximately parallel to the surface, having distinct characteristics produced by soil-forming processes. In the identification of soil horizons, an uppercase letter represents the major horizons. Numbers or lowercase letters that follow represent subdivisions of the major horizons. An explanation of the subdivisions is given in the "Soil Survey Manual." The major horizons of mineral soil are as follows:

O horizon.—An organic layer of fresh and decaying plant residue.

A horizon.—The mineral horizon at or near the surface in which an accumulation of humified organic matter is mixed with the mineral material. Also, a plowed surface horizon, most of which was originally part of a B horizon.

E horizon.—The mineral horizon in which the main feature is loss of silicate clay, iron, aluminum, or some combination of these.

B horizon.—The mineral horizon below an A horizon. The B horizon is in part a layer of transition from the overlying A to the underlying C horizon. The B horizon also has distinctive

characteristics, such as (1) accumulation of clay, sesquioxides, humus, or a combination of these; (2) prismatic or blocky structure; (3) redder or browner colors than those in the A horizon; or (4) a combination of these.

C horizon.—The mineral horizon or layer, excluding indurated bedrock, that is little affected by soil-forming processes and does not have the properties typical of the overlying soil material. The material of a C horizon may be either like or unlike that in which the solum formed. If the material is known to differ from that in the solum, an Arabic numeral, commonly a 2, precedes the letter C.

Cr horizon.—Soft, consolidated bedrock beneath the soil.

R layer.—Consolidated bedrock beneath the soil. The bedrock commonly underlies a C horizon, but it can be directly below an A or a B horizon.

Humus. The well decomposed, more or less stable part of the organic matter in mineral soils.

Hydrologic soil groups. Refers to soils grouped according to their runoff potential. The soil properties that influence this potential are those that affect the minimum rate of water infiltration on a bare soil during periods after prolonged wetting when the soil is not frozen. These properties are depth to a seasonal high water table, the infiltration rate and permeability after prolonged wetting, and depth to a very slowly permeable layer. The slope and the kind of plant cover are not considered but are separate factors in predicting runoff.

Illuviation. The movement of soil material from one horizon to another in the soil profile. Generally, material is removed from an upper horizon and deposited in a lower horizon.

Impervious soil. A soil through which water, air, or roots penetrate slowly or not at all. No soil is absolutely impervious to air and water all the time.

Increasers. Species in the climax vegetation that increase in amount as the more desirable plants are reduced by close grazing. Increasers commonly are the shorter plants and the less palatable to livestock.

Infiltration. The downward entry of water into the immediate surface of soil or other material, as contrasted with percolation, which is movement of water through soil layers or material.

Infiltration capacity. The maximum rate at which water can infiltrate into a soil under a given set of conditions.

Infiltration rate. The rate at which water penetrates the surface of the soil at any given instant, usually expressed in inches per hour. The rate can be limited by the infiltration capacity of the soil or the rate at which water is applied at the surface.

Interfluve. An elevated area between two drainageways that sheds water to those drainageways.

Intermittent stream. A stream, or reach of a stream, that flows for prolonged periods only when it receives ground-water discharge or long, continued contributions from melting snow or other surface and shallow subsurface sources.

Invaders. On range, plants that encroach into an area and grow after the climax vegetation has been reduced by grazing. Generally, plants invade following disturbance of the surface.

Iron depletions. Low-chroma zones having a low content of iron and manganese oxide because of chemical reduction and removal, but having a clay content similar to that of the adjacent matrix. A type of redoximorphic depletion.

Knoll. A small, low, rounded hill rising above adjacent landforms.

Lamellae. Bands or layers containing translocated clay, which occur at irregular intervals in a soil profile. Coarser material typically occurs between bands. Lamellae constitute an argillic horizon when their cumulative thickness exceeds six inches.

Large stones (in tables). Rock fragments 3 inches (7.6 centimeters) or more across. Large stones adversely affect the specified use of the soil.

Leaching. The removal of soluble material from soil or other material by percolating water.

Lignite. Soft, dark brown to black coal which occurs as a powdery material or as fine flakes in some soils and parent materials.

Liquid limit. The moisture content at which the soil passes from a plastic to a liquid state.

Loam. Soil material that is 7 to 27 percent clay particles, 28 to 50 percent silt particles, and less than 52 percent sand particles.

Loess. Fine grained material, dominantly of silt-sized particles, deposited by wind.

Low strength. The soil is not strong enough to support loads.

Masses. Concentrations of substances in the soil matrix that do not have a clearly defined boundary with the surrounding soil material and cannot be removed as a discrete unit. Common compounds making up masses are calcium

carbonate, gypsum or other soluble salts, iron oxide, and manganese oxide. Masses consisting of iron oxide or manganese oxide generally are considered a type of redoximorphic concentration.

Mechanical treatment. Use of mechanical equipment for seeding, brush management, and other management practices.

Medium textured soil. Very fine sandy loam, loam, silt loam, or silt.

Mesa. A broad, nearly flat topped and commonly isolated upland mass characterized by summit widths that are more than the heights of bounding erosional scarps.

Mineral soil. Soil that is mainly mineral material and low in organic material. Its bulk density is more than that of organic soil.

Minimum tillage. Only the tillage essential to crop production and prevention of soil damage.

Miscellaneous area. An area that has little or no natural soil and supports little or no vegetation.

Moderately coarse textured soil. Coarse sandy loam, sandy loam, or fine sandy loam.

Moderately fine textured soil. Clay loam, sandy clay loam, or silty clay loam.

Mollic epipedon. A thick, dark, humus-rich surface horizon (or horizons) that has high base saturation and pedogenic soil structure. It may include the upper part of the subsoil.

Morphology, soil. The physical makeup of the soil, including the texture, structure, porosity, consistence, color, and other physical, mineral, and biological properties of the various horizons, and the thickness and arrangement of those horizons in the soil profile.

Mottling, soil. Irregular spots of different colors that vary in number and size. Descriptive terms are as follows: abundance—*few, common,* and *many;* size—*fine, medium,* and *coarse;* and contrast—*faint, distinct,* and *prominent.* The size measurements are of the diameter along the greatest dimension. *Fine* indicates less than 5 millimeters (about 0.2 inch); *medium,* from 5 to 15 millimeters (about 0.2 to 0.6 inch); and *coarse,* more than 15 millimeters (about 0.6 inch).

Munsell notation. A designation of color by degrees of three simple variables—hue, value, and chroma. For example, a notation of 10YR 6/4 is a color with hue of 10YR, value of 6, and chroma of 4.

Natric horizon. A special kind of argillic horizon that contains enough exchangeable sodium to have an adverse effect on the physical condition of the subsoil.

Neutral soil. A soil having a pH value of 6.6 to 7.3. (See Reaction, soil.)

Nodules. Cemented bodies lacking visible internal structure. Calcium carbonate, iron oxide, and manganese oxide are common compounds making up nodules. If formed in place, nodules of iron oxide or manganese oxide are considered types of redoximorphic concentrations.

Nose slope. A geomorphic component of hills consisting of the projecting end (laterally convex area) of a hillside. The overland waterflow is predominantly divergent.

Nutrient, plant. Any element taken in by a plant essential to its growth. Plant nutrients are mainly nitrogen, phosphorus, potassium, calcium, magnesium, sulfur, iron, manganese, copper, boron, and zinc obtained from the soil and carbon, hydrogen, and oxygen obtained from the air and water.

Organic matter. Plant and animal residue in the soil in various stages of decomposition. The content of organic matter in the surface layer is described as follows:

Very low	less than 0.5 percent
Low	0.5 to 1.0 percent
Moderately low	1.0 to 2.0 percent
Moderate	2.0 to 4.0 percent
High	4.0 to 8.0 percent
Very high	more than 8.0 percent

Pan. A compact, dense layer in a soil that impedes the movement of water and the growth of roots. For example, *hardpan, fragipan, claypan, plowpan,* and *traffic pan.*

Parent material. The unconsolidated organic and mineral material in which soil forms.

Ped. An individual natural soil aggregate, such as a granule, a prism, or a block.

Pedisediment. A thin layer of alluvial material that mantles an erosion surface and has been transported to its present position from higher lying areas of the erosion surface.

Pedon. The smallest volume that can be called "a soil." A pedon is three dimensional and large enough to permit study of all horizons. Its area ranges from about 10 to 100 square feet (1 square meter to 10 square meters), depending on the variability of the soil.

Percolation. The movement of water through the soil.

Percs slowly (in tables). The slow movement of

water through the soil adversely affects the specified use.

Permeability. The quality of the soil that enables water or air to move downward through the profile. The rate at which a saturated soil transmits water is accepted as a measure of this quality. In soil physics, the rate is referred to as "saturated hydraulic conductivity," which is defined in the "Soil Survey Manual." In line with conventional usage in the engineering profession and with traditional usage in published soil surveys, this rate of flow continues to be expressed as "permeability." Terms describing permeability, measured in inches per hour, are as follows:

Extremely slow	0.0 to 0.01 inch
Very slow	0.01 to 0.06 inch
Slow	0.06 to 0.2 inch
Moderately slow	0.2 to 0.6 inch
Moderate	0.6 inch to 2.0 inches
Moderately rapid	2.0 to 6.0 inches
Rapid	6.0 to 20 inches
Very rapid	more than 20 inches

Phase, soil. A subdivision of a soil series based on features that affect its use and management, such as slope, stoniness, and flooding.

pH value. A numerical designation of acidity and alkalinity in soil. (See Reaction, soil.)

Piping (in tables). Formation of subsurface tunnels or pipelike cavities by water moving through the soil.

Plasticity index. The numerical difference between the liquid limit and the plastic limit; the range of moisture content within which the soil remains plastic.

Plastic limit. The moisture content at which a soil changes from semisolid to plastic.

Playa. The generally dry and nearly level lake plain that occupies the lowest parts of closed depressional areas, such as those on intermontane basin floors. Temporary or seasonal ponding occurs primarily in response to precipitation and runoff.

Plowpan. A compacted layer formed in the soil directly below the plowed layer.

Ponding. Standing water on soils in closed depressions. Unless the soils are artificially drained, the water can be removed only by percolation or evapotranspiration.

Poor filter (in tables). Because of rapid or very rapid permeability, the soil may not adequately filter effluent from a waste disposal system.

Poorly graded. Refers to a coarse grained soil or soil material consisting mainly of particles of nearly the same size. Because there is little difference in size of the particles, density can be increased only slightly by compaction.

Poor outlets (in tables). Refers to areas where surface or subsurface drainage outlets are difficult or expensive to install.

Porcelanite. A hard rock-like material of relatively low specific gravity, formed by the baking and fusing of shale and sandstone adjacent to (commonly overlying) burned-out coal seams. A material which is more resistant to weathering than surrounding Tertiary formations, porcelanite typically forms rounded, rolling to steep hills and conical peaks that occur throughout the eastern half of the survey area. It is resistant to erosion.

Potential native plant community. See Climax plant community.

Potential rooting depth (effective rooting depth). Depth to which roots could penetrate if the content of moisture in the soil were adequate. The soil has no properties restricting the penetration of roots to this depth.

Prescribed burning. Deliberately burning an area for specific management purposes, under the appropriate conditions of weather and soil moisture and at the proper time of day.

Productivity, soil. The capability of a soil for producing a specified plant or sequence of plants under specific management.

Profile, soil. A vertical section of the soil extending through all its horizons and into the parent material.

Proper grazing use. Grazing at an intensity that maintains enough cover to protect the soil and maintain or improve the quantity and quality of the desirable vegetation. This practice increases the vigor and reproduction capacity of the key plants and promotes the accumulation of litter and mulch necessary to conserve soil and water.

Range condition. The present composition of the plant community on a range site in relation to the potential natural plant community for that site. Range condition is expressed as excellent, good, fair, or poor on the basis of how much the present plant community has departed from the potential.

Rangeland. Land on which the potential natural vegetation is predominantly grasses, grasslike plants, forbs, or shrubs suitable for grazing or browsing. It includes natural grasslands, savannas, many wetlands, some deserts,

tundras, and areas that support certain forb and shrub communities.

Range site. An area of rangeland where climate, soil, and relief are sufficiently uniform to produce a distinct natural plant community. A range site is the product of all the environmental factors responsible for its development. It is typified by an association of species that differ from those on other range sites in kind or proportion of species or total production.

Reaction, soil. A measure of acidity or alkalinity of a soil, expressed in pH values. A soil that tests to pH 7.0 is described as precisely neutral in reaction because it is neither acid nor alkaline. The degrees of acidity or alkalinity, expressed as pH values, are:

Ultra acid	less than 3.5
Extremely acid	3.5 to 4.4
Very strongly acid	4.5 to 5.0
Strongly acid	5.1 to 5.5
Moderately acid	5.6 to 6.0
Slightly acid	6.1 to 6.5
Neutral	6.6 to 7.3
Slightly alkaline	7.4 to 7.8
Moderately alkaline	7.9 to 8.4
Strongly alkaline	8.5 to 9.0
Very strongly alkaline	9.1 and higher

Redoximorphic concentrations. Nodules, concretions, soft masses, pore linings, and other features resulting from the accumulation of iron or manganese oxide. An indication of chemical reduction and oxidation resulting from saturation.

Redoximorphic depletions. Low-chroma zones from which iron and manganese oxide or a combination of iron and manganese oxide and clay has been removed. These zones are indications of the chemical reduction of iron resulting from saturation.

Redoximorphic features. Redoximorphic concentrations, redoximorphic depletions, reduced matrices, a positive reaction to alpha, alpha-dipyridyl, and other features indicating the chemical reduction and oxidation of iron and manganese compounds resulting from saturation.

Reduced matrix. A soil matrix that has low chroma in situ because of chemically reduced iron (Fe II). The chemical reduction results from nearly continuous wetness. The matrix undergoes a change in hue or chroma within 30 minutes after exposure to air as the iron is oxidized (Fe III). A type of redoximorphic feature.

Relief. The elevations or inequalities of a land surface, considered collectively.

Residuum (residual soil material). Unconsolidated, weathered or partly weathered mineral material that accumulated as consolidated rock disintegrated in place.

Ridge. A long, narrow elevation of land surface, usually sharp crested with steep sides and forming an extended upland between valleys.

Rill. A steep-sided channel resulting from accelerated erosion. A rill generally is a few inches deep and not wide enough to be an obstacle to farm machinery.

Road cut. A sloping surface produced by mechanical means during road construction. It is commonly on the uphill side of the road.

Rock fragments. Rock or mineral fragments having a diameter of 2 millimeters or more; for example, pebbles, cobbles, stones, and boulders.

Rooting depth (in tables). Shallow root zone. The soil is shallow over a layer that greatly restricts roots.

Root zone. The part of the soil that can be penetrated by plant roots.

Runoff. The precipitation discharged into stream channels from an area. The water that flows off the surface of the land without sinking into the soil is called surface runoff. Water that enters the soil before reaching surface streams is called ground-water runoff or seepage flow from ground water.

Saline soil. A soil containing soluble salts in an amount that impairs growth of plants. A saline soil does not contain excess exchangeable sodium.

Sand. As a soil separate, individual rock or mineral fragments from 0.05 millimeter to 2.0 millimeters in diameter. Most sand grains consist of quartz. As a soil textural class, a soil that is 85 percent or more sand and not more than 10 percent clay.

Sandstone. Sedimentary rock containing dominantly sand-sized particles.

Saturation. Wetness characterized by zero or positive pressure of the soil water. Under conditions of saturation, the water will flow from the soil matrix into an unlined auger hole.

Sedimentary rock. Rock made up of particles deposited from suspension in water. The chief kinds of sedimentary rock are conglomerate, formed from gravel; sandstone, formed from sand; shale, formed from clay; and limestone, formed from soft masses of calcium carbonate. There are many intermediate types. Some wind-deposited sand is consolidated into sandstone.

Seepage (in tables). The movement of water through the soil. Seepage adversely affects the specified use.

Sequum. A sequence consisting of an illuvial horizon and the overlying eluvial horizon. (See Eluviation.)

Series, soil. A group of soils that have profiles that are almost alike, except for differences in texture of the surface layer. All the soils of a series have horizons that are similar in composition, thickness, and arrangement.

Shale. Sedimentary rock formed by the hardening of a clay deposit.

Sheet erosion. The removal of a fairly uniform layer of soil material from the land surface by the action of rainfall and surface runoff.

Shoulder. The position that forms the uppermost inclined surface near the top of a hillslope. It is a transition from backslope to summit. The surface is dominantly convex in profile and erosional in origin.

Shrink-swell (in tables). The shrinking of soil when dry and the swelling when wet. Shrinking and swelling can damage roads, dams, building foundations, and other structures. It can also damage plant roots.

Side slope. A geomorphic component of hills consisting of a laterally planar area of a hillside. The overland waterflow is predominantly parallel.

Silica. A combination of silicon and oxygen. The mineral form is called quartz.

Silt. As a soil separate, individual mineral particles that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). As a soil textural class, soil that is 80 percent or more silt and less than 12 percent clay.

Siltstone. Sedimentary rock made up of dominantly silt-sized particles.

Similar soils. Soils that share limits of diagnostic criteria, behave and perform in a similar manner, and have similar conservation needs or management requirements for the major land uses in the survey area.

Slickensides. Polished and grooved surfaces produced by one mass sliding past another. In soils, slickensides may occur at the bases of slip surfaces on the steeper slopes; on faces of blocks, prisms, and columns; and in swelling clayey soils, where there is marked change in moisture content.

Slickspot. A small area of soil having a puddled, crusted, or smooth surface and an excess of exchangeable sodium. The soil generally is silty or clayey, is slippery when wet, and is low in productivity.

Slippage (in tables). Soil mass susceptible to movement downslope when loaded, excavated, or wet.

Slope. The inclination of the land surface from the horizontal. Percentage of slope is the vertical distance divided by horizontal distance, then multiplied by 100. Thus, a slope of 20 percent is a drop of 20 feet in 100 feet of horizontal distance. In this survey, classes for simple slopes are as follows:

Nearly level	0 to 3 percent
Gently sloping	3 to 6 percent
Moderately sloping	6 to 15 percent
Moderately steep	15 to 30 percent
Steep	30 to 60 percent
Very steep	60 percent and higher

Slope (in tables). Slope is great enough that special practices are required to ensure satisfactory performance of the soil for a specific use.

Slow intake (in tables). The slow movement of water into the soil.

Slow refill (in tables). The slow filling of ponds, resulting from restricted permeability in the soil.

Small stones (in tables). Rock fragments less than 3 inches (7.6 centimeters) in diameter. Small stones adversely affect the specified use of the soil.

Sodic (alkali) soil. A soil having so high a degree of alkalinity (pH 8.5 or higher) or so high a percentage of exchangeable sodium (15 percent or more of the total exchangeable bases), or both, that plant growth is restricted.

Soft bedrock. Bedrock that can be excavated with trenching machines, backhoes, small rippers, and other equipment commonly used in construction.

Soil. A natural, three-dimensional body at the earth's surface. It is capable of supporting plants and has properties resulting from the integrated effect of climate and living matter acting on earthy parent material, as conditioned by relief over periods of time.

Soil separates. Mineral particles less than 2 millimeters in equivalent diameter and ranging between specified size limits. The names and sizes, in millimeters, of separates recognized in the United States are as follows:

Very coarse sand	2.0 to 1.0
Coarse sand	1.0 to 0.5

Medium sand	0.5 to 0.25
Fine sand	0.25 to 0.10
Very fine sand	0.10 to 0.05
Silt	0.05 to 0.002
Clay	less than 0.002

Solum. The upper part of a soil profile, above the C horizon, in which the processes of soil formation are active. The solum in soil consists of the A, E, and B horizons. Generally, the characteristics of the material in these horizons are unlike those of the material below the solum. The living roots and plant and animal activities are largely confined to the solum.

Stones. Rock fragments 10 to 24 inches (25 to 60 centimeters) in diameter if rounded or 15 to 24 inches (38 to 60 centimeters) in length if flat.

Stony. Refers to a soil containing stones in numbers that interfere with or prevent tillage.

Stripcropping. Growing crops in a systematic arrangement of strips or bands that provide vegetative barriers to wind erosion and water erosion.

Structure, soil. The arrangement of primary soil particles into compound particles or aggregates. The principal forms of soil structure are—*platy* (laminated), *prismatic* (vertical axis of aggregates longer than horizontal), *columnar* (prisms with rounded tops), *blocky* (angular or subangular), and *granular. Structureless* soils are either *single grained* (each grain by itself, as in dune sand) or *massive* (the particles adhering without any regular cleavage, as in many hardpans).

Stubble mulch. Stubble or other crop residue left on the soil or partly worked into the soil. It protects the soil from wind erosion and water erosion after harvest, during preparation of a seedbed for the next crop, and during the early growing period of the new crop.

Subsoil. Technically, the B horizon; roughly, the part of the solum below plow depth.

Subsoiling. Tilling a soil below normal plow depth, ordinarily to shatter a hardpan or claypan.

Substratum. The part of the soil below the solum.

Subsurface layer. Any surface soil horizon (A, E, AB, or EB) below the surface layer.

Summer fallow. The tillage of uncropped land during the summer to control weeds and allow storage of moisture in the soil for the growth of a later crop. A practice common in semiarid regions, where annual precipitation is not enough to produce a crop every year. Summer fallow is frequently practiced before planting winter grain.

Summit. The topographically highest position of a hillslope. It has a nearly level (planar or only slightly convex) surface.

Surface layer. The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, ranging in depth from 4 to 10 inches (10 to 25 centimeters). Frequently designated as the "plow layer," or the "Ap horizon."

Surface soil. The A, E, AB, and EB horizons, considered collectively. It includes all subdivisions of these horizons.

Syncline. A geologic unit of folded strata that are concave upward.

Taxadjuncts. Soils that cannot be classified in a series recognized in the classification system. Such soils are named for a series they strongly resemble and are designated as taxadjuncts to that series because they differ in ways too small to be of consequence in interpreting their use and behavior. Soils are recognized as taxadjuncts only when one or more of their characteristics are slightly outside the range defined for the family of the series for which the soils are named.

Terrace. An embankment, or ridge, constructed across sloping soils on the contour or at a slight angle to the contour. The terrace intercepts surface runoff so that water soaks into the soil or flows slowly to a prepared outlet. A terrace in a field generally is built so that the field can be farmed. A terrace intended mainly for drainage has a deep channel that is maintained in permanent sod.

Terrace (geologic). An old alluvial plain, ordinarily flat or undulating, bordering a river, a lake, or the sea.

Tertiary age. The period of the Cenozoic Era of geologic time from approximately 65 million to 2 million years ago.

Texture, soil. The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are *sand, loamy sand, sandy loam, loam, silt loam, silt, sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay,* and *clay.* The sand, loamy sand, and sandy loam classes may be further divided by specifying "coarse," "fine," or "very fine."

Thin layer (in tables). Otherwise suitable soil material that is too thin for the specified use.

Tilth, soil. The physical condition of the soil as related to tillage, seedbed preparation, seedling emergence, and root penetration.

Toeslope. The position that forms the gently inclined surface at the base of a hillslope. Toeslopes in profile are commonly gentle and linear and are constructional surfaces forming the lower part of a hillslope continuum that grades to valley or closed-depression floors.

Too arid (in tables). The soil is dry most of the time, and vegetation is difficult to establish.

Topsoil. The upper part of the soil, which is the most favorable material for plant growth. It is ordinarily rich in organic matter and is used to topdress roadbanks, lawns, and land affected by mining.

Toxicity (in tables). Excessive amount of toxic substances, such as sodium or sulfur, that severely hinder establishment of vegetation or severely restrict plant growth.

Trace elements. Chemical elements, for example, zinc, cobalt, manganese, copper, and iron, in soils in extremely small amounts. They are essential to plant growth.

Underlying material. That part of a soil profile below the surface layer when no subsoil is present. Technically, the C horizon in an A-C soil profile.

Unstable fill (in tables). Risk of caving or sloughing on banks of fill material.

Upland. Land at a higher elevation, in general, than the alluvial plain or stream terrace; land above the lowlands along streams.

Variegation. Refers to patterns of contrasting colors assumed to be inherited from the parent material rather than to be the result of poor drainage.

Weathering. All physical and chemical changes produced in rocks or other deposits at or near the earth's surface by atmospheric agents. These changes result in disintegration and decomposition of the material.

Well graded. Refers to soil material consisting of coarse grained particles that are well distributed over a wide range in size or diameter. Such soil normally can be easily increased in density and bearing properties by compaction. Contrasts with poorly graded soil.

Windthrow. The uprooting and tipping over of trees by the wind.

USDA United States Department of Agriculture

Natural Resources Conservation Service

In cooperation with the University of Wyoming Agricultural Experiment Station, United States Forest Service, and the Bureau of Land Management

Soil Survey of Campbell County, Wyoming, Southern Part

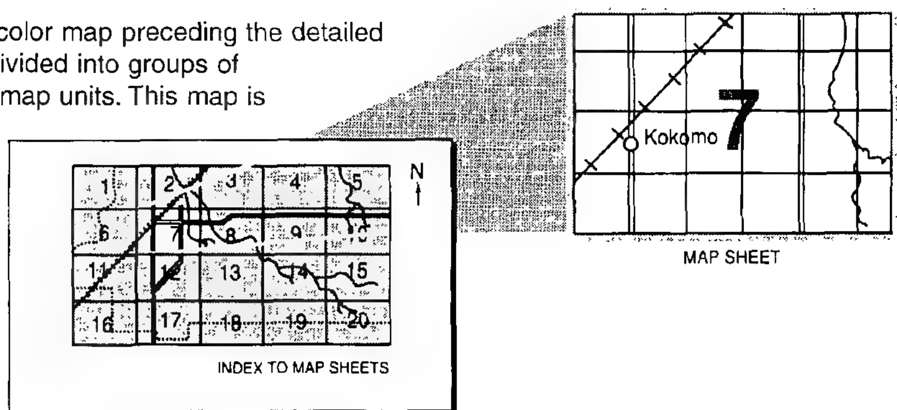
Part II

How to Use This Soil Survey

This survey is divided into three parts. Part I includes general information about the survey area; descriptions of the detailed soil map units and soil series in the area; and a description of how the soils formed. Part II describes the use and management of the soils and the major soil properties. This part may be updated as further information about soil management becomes available. Part III includes the maps.

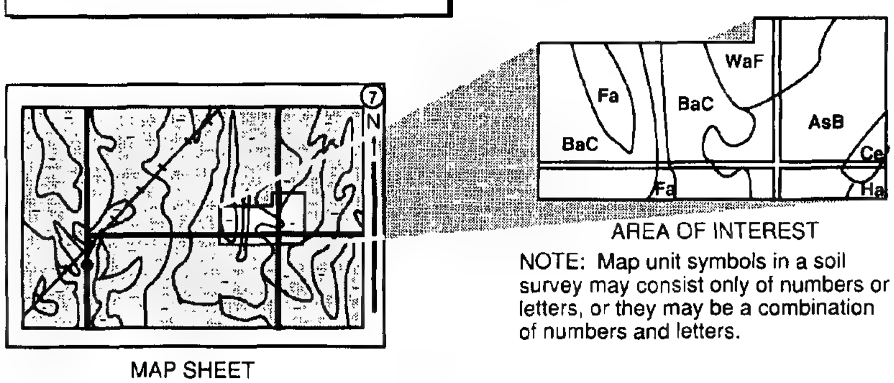
General Soil Map

The general soil map, which is the color map preceding the detailed soil maps, shows the survey area divided into groups of associated soils called general soil map units. This map is useful in planning the use and management of large areas.



To find information about your area of interest, locate that area on the map, identify the name of the map unit in the area on the color-coded map legend, then refer to the section **General Soil Map Units** for a general description of the soils in your area.

Detailed Soil Maps



NOTE: Map unit symbols in a soil survey may consist only of numbers or letters, or they may be a combination of numbers and letters.

The detailed soil maps follow the general soil map. These maps can be useful in planning the use and management of small areas.

To find information about your area of interest, locate that area on the **Index to Map Sheets**, which precedes the soil maps. Note the number of the map sheet and turn to that sheet.

Locate your area of interest on the map sheet. Note the map unit symbols that are in that area. Turn to the **Contents**, which lists the map units by symbol and name and shows the page where each map unit is described.

The **Contents** shows which table has data on a specific land use for each detailed soil map unit. Also see the **Contents** for sections of this publication that may address your specific needs.

This soil survey is a publication of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (formerly the Soil Conservation Service) has leadership for the Federal part of the National Cooperative Soil Survey.

Major fieldwork for this soil survey was completed in 1993. Soil names and descriptions were approved in 1995. Unless otherwise indicated, statements in this publication refer to conditions in the survey area in 1995. This survey was made cooperatively by the Natural Resources Conservation Service and the Bureau of Land Management, Forest Service, Wyoming Agricultural Experiment Station, and University of Wyoming Extension Service. The survey is part of the technical assistance furnished to the Intermountain Soil and Water Conservation District.

Cover: This landform is a result of the resistance of the overlying material (hard conglomerate sandstone and siltstone of the White River formation) to weathering and erosion. The White River formation is more resistant to weathering than the underlying Wasatch formation.

Additional information about the Nation's natural resources is available on the Natural Resources Conservation Service homepage on the World Wide Web. The address is http://www.nrcs.usda.gov.

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Summary of Tables

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Part II

Soil Survey of
Campbell County, Wyoming, Southern Part

This soil survey is an inventory and evaluation of the soils in the survey area. It can be used to adjust land uses to the limitations and potentials of natural resources and the environment. Also, it can help to prevent soil-related failures in land uses.

In preparing a soil survey, soil scientists, conservationists, engineers, and others collect extensive field data about the nature and behavioral characteristics of the soils. They collect data on erosion, droughtiness, flooding, and other factors that affect various soil uses and management. Field experience and collected data on soil properties and performance are used as a basis in predicting soil behavior.

Information in this section can be used to plan the use and management of soils for crops and pasture; as rangeland; as sites for buildings, sanitary facilities, highways and other transportation systems; and for wildlife habitat. It can be used to identify the potentials and limitations of each soil for specific land uses and to help prevent construction failures caused by unfavorable soil properties.

Planners and others using soil survey information can evaluate the effect of specific land uses on productivity and on the environment in all or part of the survey area. The survey can help planners to maintain or create a land use pattern in harmony with the natural soil.

Contractors can use this survey to locate sources of sand and gravel, roadfill, and topsoil. They can use it to identify areas where bedrock, wetness, or very firm soil layers can cause difficulty in excavation.

Health officials, highway officials, engineers, and others may also find this survey useful. The survey can help them plan the safe disposal of wastes and locate sites for pavements, sidewalks, campgrounds, playgrounds, lawns, and trees and shrubs.

The classification and extent of the soils in this county are shown in the tables "Classification of the Soils" and "Acreage and Proportionate Extent of the Soils" which follow this section.

Classification of the Soils

(An asterisk in the first column indicates a taxadjunct to the series. See text for a description of those characteristics that are outside the range of the series.)

Soil name	Family or higher taxonomic class
Absted	Fine, smectitic, mesic Haplic Ustic Natrargids
Aridic Ustorthents	Aridic Ustorthents
Arvada	Fine, smectitic, mesic Vertic Natrargids
Arwite	Fine-loamy, mixed, superactive, mesic Aridic Haplustalfs
Ashollow	Coarse-loamy, mixed, superactive, calcareous, mesic Aridic Ustorthents
Bidman	Fine, smectitic, mesic Ustic Paleargids
Boruff	Fine, smectitic, calcareous, mesic Vertid Fluvaquents
Bowbac	Fine-loamy, mixed, superactive, mesic Ustic Haplargids
Brislawn	Fine, smectitic, mesic Aridic Paleustalfs
Cambria	Fine-loamy, mixed, superactive, mesic Ustic Haplargids
Clarkelen	Coarse-loamy, mixed, superactive, calcareous, mesic Ustic Torrifluvents
*Clarkelen	Coarse-loamy, mixed, superactive, nonacid, mesic Ustic Torrifluvents
Cromack	Fine, smectitic, mesic Aridic Haplustepts
Cushman	Fine-loamy, mixed, superactive, mesic Ustic Haplargids
Decolney	Fine-loamy, mixed, superactive, mesic Ustic Haplargids
Deekay	Fine-loamy, mixed, superactive, mesic Aridic Haplustalfs
Draknab	Sandy, mixed, mesic Ustic Torrifluvents
Echeta	Fine, smectitic, mesic Torrertic Haplustepts
Elwop	Fine-loamy, mixed, superactive, mesic Aridic Haplustalfs
Embry	Coarse-loamy, mixed, superactive, nonacid, mesic Ustic Torriorthents
Emigha	Fine-silty, mixed, superactive, mesic Ustifluventic Haplocambids
Fairburn	Loamy, mixed, superactive, calcareous, mesic, shallow Aridic Ustorthents
Felix	Very-fine, smectitic, mesic Aridic Epiaquerts
Forkwood	Fine-loamy, mixed, superactive, mesic Ustic Haplargids
Gateson	Fine-loamy, mixed, superactive, mesic Aridic Haplustalfs
Haverdad	Fine-loamy, mixed, superactive, calcareous, mesic Ustic Torrifluvents
Heldt	Fine, smectitic, mesic Ustertic Haplocambids
Hiland	Fine-loamy, mixed, superactive, mesic Ustic Calciargids
Hilight	Clayey, smectitic, nonacid, mesic, shallow Ustic Torriorthents
Ironbutte	Loamy-skeletal over fragmental, mixed, superactive, nonacid, mesic Aridic Ustorthents
Iwait	Fine-loamy, mixed, superactive, calcareous, mesic Aridic Ustorthents
Jayem	Coarse-loamy, mixed, superactive, mesic Aridic Haplustolls
Jaywest	Fine, smectitic, mesic Aridic Paleustalfs
Julesburg	Coarse-loamy, mixed, superactive, mesic Aridic Argiustolls
Keeline	Coarse-loamy, mixed, superactive, calcareous, mesic Ustic Torriorthents
Keyner	Fine-loamy, mixed, superactive, mesic Haplic Ustic Natrargids
Kishona	Fine-loamy, mixed, superactive, calcareous, mesic Ustic Torriorthents
Lawver	Fine, smectitic, mesic Ustic Paleargids
Leiter	Fine, smectitic, mesic Aridic Haplustalfs
Lismas	Clayey, smectitic, nonacid, mesic, shallow Aridic Ustorthents
Maysdorf	Fine-loamy, mixed, superactive, mesic Ustic Calciargids
Mittenbutte	Loamy, mixed, superactive, calcareous, mesic, shallow Aridic Ustorthents
*Mittenbutte	Loamy, mixed, superactive, nonacid, mesic, shallow Aridic Ustorthents
Moorhead	Fine, smectitic, mesic Aridic Haplustalfs
Moskee	Fine-loamy, mixed, superactive, mesic Aridic Argiustolls
Muleherder	Loamy-skeletal over fragmental, mixed, superactive, mesic Aridic Haplustepts
Niobrara	Mixed, mesic, shallow Aridic Ustipsamments
*Niobrara	Mixed, mesic, shallow Aridic Ustipsamments
Nuncho	Fine, smectitic, mesic Aridic Argiustolls
Oldwolf	Fine-loamy, mixed, superactive, mesic Aridic Haplustalfs
Orpha	Mixed, mesic Ustic Torripsamments
Oshoto	Fine-silty, mixed, superactive, mesic Aridic Haplustalfs
Parmleed	Fine, smectitic, mesic Ustic Paleargids
Pitchdraw	Coarse-loamy, mixed, superactive, calcareous, mesic Aridic Ustorthents
Platmak	Fine, smectitic, mesic Aridic Paleustolls
Pugsley	Fine-loamy, mixed, superactive, mesic Ustic Haplargids
Rauzi	Fine-loamy, mixed, superactive, mesic Aridic Haplustalfs
Recluse	Fine-loamy, mixed, superactive, mesic Aridic Argiustolls
Renohill	Fine, smectitic, mesic Ustic Haplargids

Classification of the Soils--Continued

Soil name	Family or higher taxonomic class
Rockybutte	Fine-loamy, mixed, superactive, mesic Aridic Haplustalfs
Rockypoint	Fine-loamy, mixed, superactive, calcareous, mesic Aridic Ustifluvents
Sabatka	Fine, smectitic, mesic Aridic Haplustepts
Samday	Clayey, smectitic, calcareous, mesic, shallow Ustic Torriorthents
Samsil	Clayey, smectitic, calcareous, mesic, shallow Aridic Ustorthents
Savageton	Fine, smectitic, mesic Ustic Haplocambids
Shingle	Loamy, mixed, superactive, calcareous, mesic, shallow Ustic Torriorthents
Silhouette	Fine, smectitic, mesic Ustic Haplocambids
Sodawells	Coarse-loamy, mixed, superactive, calcareous, mesic Aridic Ustifluvents
Spottedhorse	Fine, smectitic, mesic Aridic Paleustalfs
Taluce	Loamy, mixed, superactive, calcareous, mesic, shallow Ustic Torriorthents
*Taluce	Loamy, mixed, superactive, nonacid, mesic, shallow Ustic Torriorthents
Teckla	Fine-loamy, mixed, superactive, mesic Ustic Haplargids
Terro	Coarse-loamy, mixed, superactive, mesic Ustic Haplargids
Theedle	Fine-loamy, mixed, superactive, calcareous, mesic Ustic Torriorthents
Torriarents	Torriarents
Torriorthents	Torriorthents
Tullock	Mixed, mesic Ustic Torripsamments
Turnercrest	Coarse-loamy, mixed, superactive, calcareous, mesic Ustic Torriorthents
*Turnercrest	Coarse-loamy, mixed, superactive, nonacid, mesic Ustic Torriorthents
Ucross	Fine-loamy, mixed, superactive, calcareous, mesic Aridic Ustorthents
Ulm	Fine, smectitic, mesic Ustic Haplargids
Ustic Torriorthents	Ustic Torriorthents
Valent	Mixed, mesic Aridic Ustipsamments
Vonalee	Coarse-loamy, mixed, superactive, mesic Ustic Haplargids
Vonalf	Coarse-loamy, mixed, superactive, mesic Aridic Haplustalfs
Wags	Fine, smectitic, nonacid, mesic Ustic Torriorthents
Wibaux	Loamy-skeletal over fragmental, mixed, superactive, nonacid, mesic Ustic Torriorthents
*Wibaux	Loamy-skeletal over fragmental, mixed, superactive, nonacid, mesic Ustic Torriorthents
Worf	Loamy, mixed, superactive, mesic, shallow Ustic Haplargids
Worfka	Clayey, smectitic, mesic, shallow Ustic Haplargids
Wyarno	Fine, smectitic, mesic Ustic Haplargids
Wyotite	Fine-silty, mixed, superactive, mesic Ustic Haplargids
Xema	Coarse-loamy, mixed, superactive, mesic Aridic Haplustalfs
Ziggy	Fine-loamy, mixed, superactive, mesic Aridic Haplustepts
Zigweid	Fine-loamy, mixed, superactive, mesic Ustic Haplocambids

Acreage and Proportionate Extent of the Soils

Map symbol	Soil name	Acres	Percent
100	Aridic Ustorthents, saline, 0 to 4 percent slopes	1,548	*
101	Arvada, thick surface very fine sandy loam, 0 to 6 percent slopes	3,890	0.2
102	Arvada, thick surface-Arvada-Slickspots complex, 0 to 6 percent slopes	36,028	2.0
103	Arwite fine sandy loam, 0 to 6 percent slopes	11,006	0.6
104	Arwite fine sandy loam, 6 to 15 percent slopes	2,257	0.1
105	Arwite-Elwop fine sandy loams, 0 to 6 percent slopes	6,623	0.4
106	Arwite-Elwop fine sandy loams, 6 to 15 percent slopes	7,885	0.4
107	Arwite-Vonalf fine sandy loams, 0 to 6 percent slopes	6,961	0.4
108	Arwite-Vonalf fine sandy loams, 6 to 15 percent slopes	2,684	0.1
109	Bidman loam, 0 to 6 percent slopes	9,374	0.5
110	Bidman loam, loamy substratum, 0 to 6 percent slopes	3,961	0.2
111	Bidman-Parmleed loams, 0 to 6 percent slopes	36,035	2.0
112	Bidman-Parmleed loams, 6 to 15 percent slopes	8,726	0.5
113	Bidman-Ulm loams, 0 to 6 percent slopes	26,627	1.5
114	Bowbac-Taluce-Badland complex, 3 to 20 percent slopes	1,074	*
115	Bowbac-Worf fine sandy loams, 3 to 15 percent slopes	2,420	0.1
116	Cambria-Kishona-Zigweid loams, 0 to 6 percent slopes	28,172	1.6
117	Cambria-Kishona-Zigweid loams, 6 to 15 percent slopes	11,599	0.6
118	Clarkelen-Draknab complex, 0 to 3 percent slopes	2,429	0.1
119	Clarkelen-Embry fine sandy loams, 0 to 4 percent slopes	5,139	0.3
120	Clarkelen-Keeline association, 0 to 6 percent slopes	2,316	0.1
121	Cushman-Cambria loams, 0 to 6 percent slopes	17,480	1.0
122	Cushman-Cambria loams, 6 to 15 percent slopes	21,127	1.2
123	Cushman-Renohill loams, 6 to 15 percent slopes	3,321	0.2
124	Cushman-Shingle loams, 6 to 15 percent slopes	9,295	0.5
125	Cushman-Terro complex, 6 to 15 percent slopes	311	*
126	Cushman-Theedle loams, 0 to 6 percent slopes	8,590	0.5
127	Cushman-Theedle loams, 6 to 15 percent slopes	12,765	0.7
128	Cushman-Worf loams, 3 to 15 percent slopes	10,501	0.6
129	Decolney-Hiland fine sandy loams, 0 to 6 percent slopes	16,891	0.9
130	Decolney-Hiland fine sandy loams, 6 to 15 percent slopes	2,923	0.2
131	Deekay loam, 0 to 6 percent slopes	5,801	0.3
132	Deekay-Moorhead loams, 0 to 6 percent slopes	11,431	0.6
133	Deekay-Moorhead loams, 6 to 15 percent slopes	2,251	0.1
134	Deekay-Oldwolf loams, 0 to 6 percent slopes	16,292	0.9
135	Deekay-Oldwolf loams, 6 to 15 percent slopes	14,117	0.8
136	Deekay-Ziggy loams, 0 to 6 percent slopes	5,027	0.3
137	Echeta clay loam, 0 to 6 percent slopes	2,075	0.1
138	Echeta-Cromack clay loams, 6 to 15 percent slopes	2,710	0.2
139	Embry-Orpha complex, 3 to 15 percent slopes	6,322	0.4
140	Embry-Taluce sandy loams, 3 to 20 percent slopes	3,100	0.2
141	Emigha loam, 0 to 3 percent slopes	2,538	0.1
142	Emigha, sodic-Arvada, thick surface complex, 0 to 4 percent slopes	4,190	0.2
143	Felix clay, ponded, 0 to 2 percent slopes	4,999	0.3
144	Forkwood loam, 0 to 6 percent slopes	17,180	1.0
145	Forkwood-Cambria loams, 0 to 6 percent slopes	27,808	1.6
146	Forkwood-Cushman loams, 0 to 6 percent slopes	93,833	5.2
147	Forkwood-Cushman loams, 6 to 15 percent slopes	52,821	2.9
148	Forkwood-Ulm loams, 0 to 6 percent slopes	42,956	2.4
149	Forkwood-Ulm loams, 6 to 15 percent slopes	5,313	0.3
150	Gateson-Taluce-Turnercrest complex, 6 to 30 percent slopes	11,461	0.6
151	Haverdad loam, 0 to 3 percent slopes	9,753	0.5
152	Haverdad-Clarkelen complex, 0 to 4 percent slopes	2,082	0.1
153	Haverdad-Kishona association, 0 to 6 percent slopes	11,770	0.7
154	Heldt clay loam, 0 to 6 percent slopes	4,048	0.2
155	Heldt-Bidman complex, saline, 0 to 3 percent slopes	3,411	0.2
156	Hiland fine sandy loam, 0 to 6 percent slopes	5,334	0.3
157	Hiland-Bowbac fine sandy loams, 0 to 6 percent slopes	60,415	3.4
158	Hiland-Bowbac fine sandy loams, 6 to 15 percent slopes	53,710	3.0
159	Hiland-Vonalee fine sandy loams, 0 to 6 percent slopes	12,405	0.7
160	Hiland-Vonalee fine sandy loams, 6 to 15 percent slopes	5,527	0.3

* See footnote at end of table.

Acreage and Proportionate Extent of the Soils--Continued

Map symbol	Soil name	Acres	Percent
161	Hilight-Taluce, cool-Wags complex, 6 to 40 percent slopes	5,187	0.3
162	Lismas-Mittenbutte, cool-Sabatka complex, 6 to 40 percent slopes	2,965	0.2
163	Hilight-Wags-Badland complex, 3 to 45 percent slopes	80,864	4.5
164	Lismas-Sabatka-Badland complex, 3 to 45 percent slopes	6,967	0.4
165	Jayem fine sandy loam, 6 to 20 percent slopes	1,906	0.1
166	Jaywest loam, 0 to 6 percent slopes	4,668	0.3
167	Jaywest-Moorhead loams, 0 to 6 percent slopes	11,357	0.6
168	Jaywest-Spottedhorse loams, 0 to 6 percent slopes	8,484	0.5
169	Julesburg fine sandy loam, 0 to 6 percent slopes	1,225	*
170	Keeline-Tullock loamy sands, 6 to 30 percent slopes	13,678	0.8
171	Keeline-Tullock-Niobrara, dry complex, 3 to 30 percent slopes	10,236	0.6
172	Keyner fine sandy loam, 0 to 6 percent slopes	10,761	0.6
173	Lawver-Teckla-Wibaux complex, 0 to 6 percent slopes	6,217	0.3
174	Brislawn-Rockybutte-Ironbutte complex, 0 to 10 percent slopes	4,222	0.2
175	Lawver-Wibaux complex, 6 to 30 percent slopes	2,865	0.2
176	Leiter-Cromack clay loams, 3 to 15 percent slopes	1,839	0.1
177	Maysdorf fine sandy loam, 0 to 6 percent slopes	5,189	0.3
178	Maysdorf sandy clay loam, 0 to 6 percent slopes	701	*
179	Maysdorf-Pugsley sandy loams, 0 to 6 percent slopes	10,371	0.6
180	Maysdorf-Pugsley sandy loams, 6 to 15 percent slopes	6,226	0.3
181	Moorhead clay loam, 0 to 6 percent slopes	10,473	0.6
182	Moorhead loam, 0 to 6 percent slopes	2,209	0.1
183	Moorhead-Leiter clay loams, 0 to 6 percent slopes	8,315	0.5
184	Moorhead-Leiter clay loams, 6 to 15 percent slopes	8,574	0.5
185	Moskee fine sandy loam, 0 to 6 percent slopes	2,789	0.2
186	Moskee fine sandy loam, 6 to 10 percent slopes	124	*
187	Nuncho loam, 0 to 6 percent slopes	3,063	0.2
188	Orpha-Tullock loamy sands, 6 to 30 percent slopes	3,288	0.2
189	Oshoto-Moorhead loams, 0 to 6 percent slopes	2,109	0.1
190	Parmleed-Renohill complex, 3 to 15 percent slopes	5,154	0.3
191	Pits-Dumps complex	14,818	0.8
192	Platmak loam, 0 to 6 percent slopes	1,565	*
193	Pugsley-Decolney sandy loams, 0 to 6 percent slopes	1,304	*
194	Pugsley-Decolney sandy loams, 6 to 15 percent slopes	3,121	0.2
195	Rauzi fine sandy loam, 0 to 6 percent slopes	1,980	0.1
196	Rauzi sandy clay loam, 0 to 6 percent slopes	1,226	*
197	Rauzi-Elwop fine sandy loams, 2 to 10 percent slopes	3,041	0.2
198	Recluse loam, 0 to 6 percent slopes	1,458	*
199	Renohill-Savageton clay loams, 0 to 6 percent slopes	1,264	*
200	Renohill-Savageton clay loams, 6 to 15 percent slopes	2,747	0.2
201	Renohill-Shingle-Worf complex 3 to 15 percent slopes	4,458	0.2
202	Renohill-Worfka clay loams, 3 to 15 percent slopes	3,308	0.2
203	Rockypoint-Iwait association, 0 to 6 percent slopes	2,514	0.1
204	Samday-Samday, cool-Shingle clay loams, 6 to 40 percent slopes	7,685	0.4
205	Samday-Savageton clay loams, 3 to 15 percent slopes	7,108	0.4
206	Samday-Shingle-Badland complex, 10 to 45 percent slopes	16,975	0.9
207	Cromack-Fairburn-Ucross complex, 3 to 20 percent slopes	5,913	0.3
208	Savageton-Silhouette clay loams, 0 to 6 percent slopes	4,550	0.3
209	Savageton-Silhouette clay loams, 6 to 15 percent slopes	3,053	0.2
210	Shingle-Taluce complex, 3 to 30 percent slopes	11,667	0.7
211	Shingle-Worf loams, 3 to 30 percent slopes	10,117	0.6
212	Teckla very fine sandy loam, 0 to 10 percent slopes	2,445	0.1
213	Terro-Taluce sandy loams, 6 to 30 percent slopes	4,153	0.2
214	Theedle-Kishona loams, 0 to 6 percent slopes	37,258	2.1
215	Theedle-Kishona loams, 6 to 20 percent slopes	72,449	4.0
216	Theedle-Kishona-Shingle loams, 3 to 30 percent slopes	35,213	2.0
217	Theedle-Shingle loams, 3 to 30 percent slopes	105,717	5.9
218	Theedle-Turnercrest-Kishona complex, 3 to 15 percent slopes	10,481	0.6
219	Torriarents-Torriorthents complex, reclaimed	3,175	0.2
220	Pitchdraw-Ashollow-Niobrara complex, 3 to 30 percent slopes	8,099	0.5
221	Turnercrest-Keeline-Taluce fine sandy loams, 6 to 30 percent slopes	17,870	1.0
222	Turnercrest-Wibaux, thin solum-Taluce complex, 6 to 40 percent slopes	1,258	*

* See footnote at end of table.

Acreage and Proportionate Extent of the Soils--Continued

Map symbol	Soil name	Acres	Percent
223	Ucross loam, 1 to 9 percent slopes	2,562	0.1
224	Ucross-Iwait loams, 0 to 6 percent slopes	5,901	0.3
225	Ucross-Iwait-Fairburn loams, 3 to 30 percent slopes	25,650	1.4
226	Ulm loam, 0 to 6 percent slopes	8,024	0.4
227	Ulm clay loam, 0 to 6 percent slopes	18,642	1.0
228	Ulm-Renohill clay loams, 0 to 6 percent slopes	16,140	0.9
229	Ulm-Renohill clay loams, 6 to 15 percent slopes	3,707	0.2
230	Urban land-Deekay-Moorhead complex, 0 to 6 percent slopes	3,879	0.2
231	Urban land-Leiter-Moorhead complex, 3 to 10 percent slopes	779	*
232	Urban land-Pitchdraw-Ashollow complex, 6 to 15 percent slopes	604	*
233	Ustic Torriorthents, gullied	77,884	4.3
234	Ustic Torriorthents-Badland complex, 10 to 100 percent slopes	29,768	1.7
235	Vonalee fine sandy loam, 0 to 10 percent slopes	3,346	0.2
236	Vonalee-Terro fine sandy loams, 2 to 10 percent slopes	11,884	0.7
237	Vonalf fine sandy loam, 0 to 6 percent slopes	1,176	*
238	Vonalf-Xema fine sandy loams, 3 to 10 percent slopes	8,149	0.5
239	Ironbutte-Fairburn-Mittenbutte complex, 6 to 40 percent slopes	5,669	0.3
240	Wibaux-Wibaux, thin solum complex, 6 to 40 percent slopes	31,560	1.8
241	Ironbutte-Ironbutte, thin solum channery loams, 6 to 40 percent slopes	6,837	0.4
242	Ironbutte-Deekay-Moorhead association, 3 to 30 percent slopes	9,328	0.5
243	Wibaux, thick solum-Wibaux channery fine sandy loams, 3 to 40 percent slopes	8,935	0.5
244	Muleherder-Ironbutte channery loams, 3 to 40 percent slopes	5,491	0.3
245	Wibaux-Shingle-Badland complex, 6 to 60 percent slopes	8,136	0.5
246	Wyarno-Ulm clay loams, 0 to 6 percent slopes	1,268	*
247	Wyotite-Ulm loams, 0 to 6 percent slopes	2,226	0.1
248	Ziggy-Iwait loams, 0 to 6 percent slopes	6,924	0.4
249	Ziggy-Iwait loams, 6 to 15 percent slopes	2,207	0.1
250	Ziggy-Ucross-Oldwolf loams, 3 to 15 percent slopes	15,628	0.9
251	Water	285	*
	Total	1,793,243	100.0

* Less than 0.1 percent.

Agronomy

Crops and Pasture

General management needed for crops and pasture is suggested in this section. The estimated yields of the main crops and pasture plants are listed, the system of land capability classification used by the Natural Resources Conservation Service is explained, and prime farmland is described.

Planners of management systems for individual fields or farms should consider the detailed information given in the description of each soil under the heading "Detailed Soil Map Units." Specific information can be obtained from the local office of the Natural Resources Conservation Service or the Cooperative Extension Service.

Crops in Campbell County - Southern Part

All of the cropland in the survey area is nonirrigated, and winter wheat and alfalfa are the principle crops. Oats, barley, and grass hay are also grown. Summer fallow in alternate years is necessary to ensure a grain crop. About 56 percent of all cropland is used for hay production. About 34 percent is used for winter wheat, 12 percent for oats, and 8 percent for barley.

Wind erosion is the major conservation problem in the area. The risk of wind erosion can be reduced by using a resource management system that includes such practices as minimum tillage, stubble mulch tillage, and wind stripcropping.

Water erosion is a concern on some soils, especially where slopes exceed six percent. Application of a resource management system that includes such practices as contour stripcropping, terraces, grassed waterways, and stubble mulch tillage helps to overcome this problem.

An adequate level of fertility can be maintained without adding fertilizer.

Compaction as a result of tillage is a concern on some of the soils. Avoiding tillage when the soils are wet helps to maintain soil tilth.

Land Capability Classification

Land capability classification shows, in a general way, the suitability of soils for most kinds of field crops. Crops that require special management are excluded. The soils are grouped according to their limitations for field crops, the risk of damage if they are used for crops, and the way they respond to management. The criteria used in grouping the soils do not include major and generally expensive landforming that would change slope, depth, or other characteristics of the soils, nor do they include possible but unlikely major reclamation projects. Capability classification is not a substitute for interpretations designed to show suitability and limitations of groups of soils for rangeland, for woodland, or for engineering purposes.

In the capability system, as described in "Land Capability Classification" (USDA-NRCS, 1996) soils are generally grouped at three levels - capability class, subclass, and unit. Only class and subclass are used in this survey.

Capability classes, the broadest groups, are designated by numerals 1 through 8. The numerals indicate progressively greater limitations and narrower choices for practical use. The classes are defined as follows:

Class 1 soils have few limitations that restrict their use.

Class 2 soils have moderate limitations that reduce the choice of plants or that require moderate conservation practices.

Class 3 soils have severe limitations that reduce the choice of plants or that require special conservation practices, or both.

Class 4 soils have very severe limitations that reduce the choice of plants or that require very careful management, or both.

Class 5 soils are not likely to erode but have other limitations, impractical to remove, that limit their use.

Class 6 soils have severe limitations that make them generally unsuitable for cultivation.

Class 7 soils have very severe limitations that make them unsuitable for cultivation.

Class 8 soils and miscellaneous areas have limitations that nearly preclude their use for commercial crop production.

Capability subclasses are soil groups within one class. They are designated by adding a small letter, *e, w, s,* or *c,* to the class numeral, for example, 2e. The letter *e* shows that the main hazard is the risk of erosion unless close-growing plant cover is maintained; *w* shows that water in or on the soil interferes with plant growth or cultivation (in some soils the wetness can be partly corrected by artificial drainage); s shows that the soil is limited mainly because it is shallow, droughty, or stony; and *c,* used in only some parts of the United States, shows that the chief limitation is climate that is very cold or very dry.

In class 1 there are no subclasses because the soils of this class have few limitations. Class 5 contains only the subclasses indicated by *w, s,* or *c* because the soils in class 5 are subject to little or no erosion. They have other limitations that restrict their use to pasture, rangeland, woodland, wildlife habitat, or recreation.

The capability classification of map units in this survey area are given in the table "Land Capability and Yields per Acre of Crops and Pasture."

Yields per Acre

The average yields per acre that can be expected of the principal crops under a high level of management are shown in the table "Land Capability and Yields per Acre of Crops and Pasture." In any given year, yields may be higher or lower than those indicated in the table because of variations in rainfall and other climatic factors. The land capability classification of map units in the survey area also is shown in the table.

The yields are based mainly on the experience and records of farmers, conservationists, and extension agents. Available yield data from nearby counties and results of field trials and demonstrations also are considered.

The management needed to obtain the indicated yields of the various crops depends on the kind of soil and the crop. Management can include drainage, erosion control, and protection from flooding; the proper planting and seeding rates; suitable high-yielding crop varieties; appropriate and timely tillage; control of weeds, plant diseases, and harmful insects; favorable soil reaction and optimum levels of nitrogen, phosphorus, potassium, and trace elements for each crop; effective use of crop residue, barnyard manure, and green manure crops; and harvesting that ensures the smallest possible loss.

The estimated yields reflect the productive capacity of each soil for each of the principal crops. Yields are likely to increase as new production technology is developed. The productivity of a given soil compared with that of other soils, however, is not likely to change.

Crops other than those shown in the table are grown in the survey area, but estimated yields are not listed because the acreage of such crops is small. The local office of the Natural Resources Conservation Service or of the Cooperative Extension Service can provide information about the management and productivity of the soils for those crops.

Prime Farmland

Prime farmland is one of several kinds of important farmland defined by the U.S. Department of Agriculture. It is of major importance in meeting the Nation's short- and long-range needs for food and fiber. Because the supply of high-quality farmland is limited, the U.S. Department of Agriculture recognizes that responsible levels of government, as well as individuals, should encourage and facilitate the wise use of our Nation's prime farmland.

Prime farmland, as defined by the U.S. Department of Agriculture, is land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and is available for these uses. It could be cultivated land, pastureland, forest land, or other land, but it is not urban or built-up land or water areas. The soil qualities, growing season, and moisture supply are those needed for the soil to economically produce sustained high yields of crops when proper management, including water management, and acceptable farming methods are applied. In general, prime farmland has an adequate and dependable supply of moisture from precipitation or irrigation, a favorable temperature and growing season, acceptable acidity or alkalinity, an acceptable salt and sodium content, and few or no rocks. It is permeable to water and air. It is not excessively erodible or saturated with water for long periods, and it either is not frequently flooded during the growing

season or is protected from flooding. Slope ranges mainly from 0 to 6 percent. More detailed information about the criteria for prime farmland is available at the local office of the Natural Resources Conservation Service.

A recent trend in land use in some parts of the survey area has been the loss of some prime farmland to industrial and urban uses. The loss of prime farmland to other uses puts pressure on marginal lands, which generally are more erodible, droughty, and less productive and cannot be easily cultivated.

There are no mapping units in this survey area that qualify as prime farmland.

Rangeland

Glen Mitchell, area range conservationist, Natural Resources Conservation Service, Sheridan, Wyoming, helped prepare this section.

About 90 percent of the survey area is rangeland. More than 75 percent of the farm income is derived from livestock. Livestock operations are fairly evenly divided between cattle and sheep. The average size of ranches in the area is about 5,000 acres.

Annual precipitation varies from about 11 inches in the southern part of the survey area, to about 15 inches in the north. The area is well suited to livestock grazing. During most winters, snow cover is light and extended periods of supplemental feeding are not necessary.

Soil characteristics vary throughout the survey area. In general, soils in the eastern one-fourth of the survey area are shallow and moderately deep loams, clay loams, and clays. These soils are underlain by shale and sandstone. They support predominantly short and mid grasses, with coniferous tree species occurring on some sites in the Rochelle Hills. Soils in the central part of the survey area consist predominantly of moderately deep to very deep sandy loams, loams, and clay loam. They support a mixture of short, mid, and a few tall grass species. Soils in the western one-third of the survey area are shallow to very deep, and are predominantly loams and clay loams, with sandy loam and clay soils occurring in localized areas. These soils support a mixture of short and mid grasses and shrubs.

In areas that have similar climate and topography, differences in the kind and amount of vegetation produced on rangeland are closely related to the kind of soil. Effective management is based on the relationship between the soils and vegetation and water.

The table, "Rangeland Productivity and Characteristic Plant Community," shows for each soil that supports rangeland vegetation suitable for grazing, the ecological site; the total annual production of vegetation in favorable, normal, and unfavorable years; the characteristic vegetation; and the average percentage of each species. An explanation of the column headings in the table follows.

An *ecological site* is a distinctive kind of rangeland that produces a characteristic natural plant community that differs from natural plant communities on other ecological sites in kind, amount, and proportion of range plants. The relationship between soils and vegetation was ascertained during this survey; thus, ecological sites generally can be determined directly from the soil map. Soil properties that affect moisture supply and plant nutrients have the greatest influence on the productivity of range plants. Soil reaction, salt content, and a seasonal high water table are also important.

Total dry-weight production is the amount of vegetation that can be expected to grow annually on well managed rangeland that is supporting the potential natural plant community. It includes all vegetation, whether or not it is palatable to grazing animals. It includes the current year's growth of leaves, twigs, and fruits of woody plants. It does not include the increase in stem diameter of trees and shrubs. It is expressed in pounds per acre of air-dry vegetation for favorable, normal, and unfavorable years. In a favorable year, the amount and distribution of precipitation and the temperatures make growing conditions substantially better than average. In a normal year, growing conditions are about average. In an unfavorable year, growing conditions are well below average, generally because of low available soil moisture.

Dry weight is the total annual yield per acre of air-dry vegetation. Yields are adjusted to a common percent of air-dry moisture content. The relationship of green weight to air-dry weight varies according to such factors as exposure, amount of shade, recent rains, and unseasonable dry periods.

Characteristic vegetation—the grasses, forbs, and shrubs that make up most of the potential natural plant community on each soil—are listed by common name.

Under *rangeland composition*, the expected percentage of the total annual production is given for each species making up the characteristic vegetation. The amount that can be used as forage depends on the kinds of grazing animals and on the grazing season.

Range management requires a knowledge of the kinds of soil and of the potential natural plant community. It also requires an evaluation of the present range condition. Range condition is determined by comparing the present plant community with the potential natural plant community on a particular range site. The more closely the existing community resembles the potential community, the better the range condition. Range condition is an ecological rating only.

The objective in range management is to control grazing so that the plants growing on a site are about the same in kind and amount as the potential natural plant community for that site. Such management generally results in the optimum production of vegetation, control of undesirable brush species, conservation of water, and control of erosion. Sometimes, however, a range condition somewhat below the potential meets grazing needs, provides wildlife habitat, and protects soil and water resources.

Range management practices that are important to maintain productivity are proper grazing use and planned grazing systems that include proper distribution, proper season of use, and deferred grazing. Practices such as watering facilities, fences, and proper salt placement are needed to obtain proper grazing use. Improvements such as brush management, range seeding, and range renovation are dependent on the soil and climate of a given site.

Windbreaks and Environmental Plantings

Windbreaks protect livestock, buildings, and yards from wind and snow. They also protect fruit trees and gardens and furnish habitat for wildlife. Several rows of low- and high-growing broadleaf and coniferous trees and shrubs provide the most protection.

Field windbreaks are narrow plantings made at right angles to the prevailing wind and at specific intervals across the field. The interval depends on the erodibility of the soil. Field windbreaks protect cropland and crops from wind, help to keep snow on the fields, and provide food and cover for wildlife.

Environmental plantings help to beautify and screen houses and other buildings and to abate noise. The plants, mostly evergreen shrubs and trees, are closely spaced. To ensure plant survival, a healthy planting stock of suitable species should be planted properly on a well prepared site and maintained in good condition.

Most of the survey area is treeless. Trees are primarily limited to the major stream drainages, where they receive additional moisture as runoff. They also occur along the steep breaks that form the Rochelle Hills. Windbreaks have been planted in the area since the time of settlement. Most of the early plantings were for farmstead and livestock protection, and many farmstead and ranch headquarters still need this kind of protection. In planting a windbreak, the purpose of the planting, the suitability of the soils, the adaptability of the trees and shrubs to the site, and the location of the windbreak should be considered.

The establishment of a windbreak and the continued growth of the trees depend upon the careful selection of the site and of the trees and shrubs to be planted, adequate site preparation, and adequate maintenance of planted trees or seedlings. Grasses and weeds should be controlled before trees are planted, and regrowth of ground cover should be controlled during the life of the windbreak. Some replanting is generally needed after the first or second year. A supplemental watering system will ensure a higher rate of survival and promote vigorous growth.

A windbreak provides protection for a distance of about ten times the height of the trees. Low-growing shrubs should be planted in the rows on the windward side, medium or tall shrubs in the next rows, and tall trees in the center, or in the leeward rows. For adequate protection in the winter, each windbreak should be made up of at least three rows. One of the rows should be a medium-growing evergreen such as Rocky Mountain juniper or eastern redcedar. Evergreens live longer and provide more protection than broadleaf trees, but they are harder to establish and grow more slowly.

Information on the height that locally grown trees and shrubs are expected to reach in 20 years on various soils and additional information on planning windbreaks and screens and planting and caring for trees and shrubs can be obtained from the local office of the Natural Resources Conservation Service or of the Cooperative Extension Service or from a commercial nursery.

Land Capability and Yields per Acre of Crops and Pasture

(Yields in the "N" columns are for nonirrigated areas; those in the "I" columns are for irrigated areas. Yields are those that can be expected under a high level of management. Absence of a yield indicates that the soil is not suited to the crop or the crop generally is not grown on the soil.)

Map symbol and soil name	Land capability		Barley		Grass hay		Oats		Pasture		Winter wheat	
	N	I	N	I	N	I	N	I	N	I	N	I
			Bu	Bu	Tons	Tons	Bu	Bu	AUM	AUM	Bu	Bu
100:												
Aridic Ustorthents, saline	4s	---	---	---	---	---	---	---	---	---	---	---
101:												
Arvada, thick surface	4s	---	---	---	---	---	---	---	---	---	---	---
102:												
Arvada, thick surface	4s	---	---	---	---	---	---	---	---	---	---	---
Arvada	6s	---	---	---	---	---	---	---	---	---	---	---
Slickspots	8	---	---	---	---	---	---	---	---	---	---	---
103:												
Arwite	3e	---	38.00	---	1.20	---	36.00	---	0.80	---	35.00	---
104:												
Arwite	4e	---	---	---	1.00	---	---	---	0.70	---	---	---
105:												
Arwite	3e	---	---	---	1.20	---	---	---	0.80	---	---	---
Elwop	4e	---	---	---	1.00	---	---	---	0.70	---	---	---
106:												
Arwite	4e	---	---	---	---	---	---	---	---	---	---	---
Elwop	4e	---	---	---	---	---	---	---	---	---	---	---
107:												
Arwite	3e	---	---	---	1.20	---	---	---	0.80	---	---	---
Vonalf	3e	---	---	---	1.20	---	---	---	0.80	---	---	---
108:												
Arwite	4e	---	---	---	---	---	---	---	---	---	---	---
Vonalf	4e	---	---	---	---	---	---	---	---	---	---	---

Land Capability and Yields per Acre of Crops and Pasture--Continued

Map symbol and soil name	Land capability		Barley		Grass hay		Oats		Pasture		Winter wheat	
	N	I	N	I	N	I	N	I	N	I	N	I
			Bu	Bu	Tons	Tons	Bu	Bu	AUM	AUM	Bu	Bu
109:												
Bidman---------- --	4e	---	---	---	0.90	---	---	---	0.70	---	---	---
110:												
Bidman, loamy substratum--------	4e	---	---	---	---	---	---	---	---	---	-	---
111:												
Bidman-------------	4e	---	---	---	0.90	---	---	---	0.70	---	---	---
Parmleed----------	4e	---	---	---	0.70	---	---	---	0.60	---	---	---
112:												
Bidman-------------	4e	---	---	---	---	---	--	--	---	---	---	---
Parmleed-----------	4e	---	---	---	---	---	---	---	---	---	---	---
113:												
Bidman-------------	4e	---	---	---	0.90	---	---	---	0.70	---	---	---
Ulm----------------	4e	---	---	---	0.90	---	---	---	0.70	---	---	---
114:												
Bowbac-------------	4e	---	---	---	---	---	--	---	---	---	---	---
Taluce-------------	7e	---	---	---	---	---	---	---	---	---	---	---
Badland------------	8s	---	---	---	---	---	---	---	---	---	---	---
115:												
Bowbac-------------	4e	---	---	---	---	---	---	---	---	---	---	---
Worf---------------	7e	---	---	---	---	---	---	---	---	---	---	---
116:												
Cambria------------	4e	---	---	---	---	---	---	---	---	---	---	---
Kishona - - --	4e	---	---	---	---	---	---	---	---	---	---	---
Zigweid------------	4e	---	---	-	---	---	---	---	---	---	---	---

Land Capability and Yields per Acre of Crops and Pasture--Continued

Map symbol and soil name	Land capability N	Land capability I	Barley N	Barley I	Grass hay N	Grass hay I	Oats N	Oats I	Pasture N	Pasture I	Winter wheat N	Winter wheat I
			Bu	Bu	Tons	Tons	Bu	Bu	AUM	AUM	Bu	Bu
117:												
Cambria	4e	---	---	---	---	---	--	---	---	---	---	---
Kishona	4e	---	---	---	---	---	---	---	---	---	---	---
Zigweid	4e	---	---	--	---	---	---	---	---	---	---	---
118:												
Clarkelen	4e	---	---	---	---	---	---	---	---	---	---	---
Draknab	4e	---	---	---	---	---	---	--	---	---	---	---
119:												
Clarkelen	4e	---	---	---	---	-	---	---	---	---	---	---
Embry	4e	---	---	---	---	---	---	---	---	---	---	---
120:												
Clarkelen	4e	---	---	---	---	---	---	---	---		---	---
Keeline	4e	---	---	---	---	---	---	---	---	---	---	---
121:												
Cushman	4e	---	---	---	---	-	---	---	---	---	---	---
Cambria	4e	---	---		---	---	---	---	---	---	---	--
122:												
Cushman	4e	---	---	---	---	---	---	---	---	---	---	---
Cambria	4e	---	---	---	---	---	---	---	---	---	---	---
123:												
Cushman	4e	---	---	---	-	---	---	---	---	---	---	
Renohill	4e	---		---	---	---	---	---	---	---	---	---
124:												
Cushman	4e	---	---	---	---	---	---	---	---	---	---	---
Shingle	7e	---	---	---	---	- -	---	---	---	---	---	---

Land Capability and Yields per Acre of Crops and Pasture--Continued

Map symbol and soil name	Land capability		Barley		Grass hay		Oats		Pasture		Winter wheat	
	N	I	N	I	N	I	N	I	N	I	N	I
			Bu	Bu	Tons	Tons	Bu	Bu	AUM	AUM	Bu	Bu
125:												
Cushman------------	4e	---	---	---	---	---	---	---	---	---	---	---
Terro--------------	6e	---	---	---	-	---	---	---	---	---	---	---
126:												
Cushman------------	4e	---	---	---	---	---	---	---	---	---	-	---
Theedle------------	4e	---	---	---	---	---	---	---	---	---	---	---
127:												
Cushman------------	4e	---	---	--	---	---	---	---	---	---	---	---
Theedle------------	4e	---	---	---	---	---	---	---	---	---	---	---
128:												
Cushman------------	4e	---	---	---	---	---	---	---	---	---	-	---
Worf---------------	7e	---	---	---	---	---	---	---	---	---	---	---
129:												
Decolney-----------	4e	---	---	---	0.80	---	---	---	0.70	---	---	---
Hiland-------------	4e	---	---	---	0.80	--	---	---	0.70	---	---	---
130:												
Decolney-----------	4e	---	---	---	---	---	---	---	---	---	---	---
Hiland ------------	4e	---	---	---	---	---	---	---	---	---	---	---
131:												
Deekay-------------	3e	---	37.00	---	1.20	---	40.00	---	0.80	---	33.00	---
132:												
Deekay-------------	3e	---	37.00	---	1.20	---	40.00	---	0.80	--	33.00	---
Moorhead-----------	3e	---	35.00	---	1.30	---	40.00	---	0.80	---	31.00	---
133:												
Deekay-------------	4e	-	---	---	---	---	---	---	---	---	---	---
Moorhead-----------	4e	---	---	---	-	---	---	---	---	---	---	---

Land Capability and Yields per Acre of Crops and Pasture--Continued

Map symbol and soil name	Land capability N	Land capability I	Barley N	Barley I	Grass hay N	Grass hay I	Oats N	Oats I	Pasture N	Pasture I	Winter wheat N	Winter wheat I
			Bu	Bu	Tons	Tons	Bu	Bu	AUM	AUM	Bu	Bu
134:												
Deekay	3e	---	---	---	1.20	---	---	---	0.80	---	---	--
Oldwolf	4e	---	---	---	1.00	---	---	---	0.70	---	---	---
135:												
Deekay	4e	---	---	---	---	---	---	---	---	---	---	---
Oldwolf	4e	---	---	---	---	---	---	---	---	---	---	---
136:												
Deekay	3e	---	---	---	1.20	---	---	---	0.80	---	---	---
Ziggy	4e	---	---	--	1.10	---	---	---	0.70	---	--	---
137:												
Echeta	4e	---	---	---	0.80	---	---	---	0.70	---	---	---
138:												
Echeta	4e	---	---	---	---	---		---	---	---	---	---
Cromack	4e	---	---	---	---	---	---	---	---	---	---	---
139:												
Embry	4e	---	--	---	---	---	---	---	---	---	--	---
Orpha	6e	---	---	---	---	---	---	---	---	---	---	---
140:												
Embry	4e	---	---	---	---	---	---	---	---	---	---	---
Taluce	7e	---	---	---	---	---	---	---	---	---	---	---
141:												
Emigha	4e	-	---	---	---	---	---	---	---	---	---	---
142:												
Emigha, sodic	6s	---	---	---	---	---	---	---	---	---	---	---
Arvada, thick surface	4s	---	---	---	---	---	---	---	---	---	---	---
143:												
Felix, ponded	4s	---	---	---	---	---	---	---	---	---	---	---

Land Capability and Yields per Acre of Crops and Pasture--Continued

Map symbol and soil name	Land capability		Barley		Grass hay		Oats		Pasture		Winter wheat	
	N	I	N	I	N	I	N	I	N	I	N	I
			Bu	Bu	Tons	Tons	Bu	Bu	AUM	AUM	Bu	Bu
144:												
Forkwood-----------	3e	---	---	---	0.90	---	---	---	0.80	---	---	---
145:												
Forkwood-----------	4e	---	---	---	0.90	---	---	---	0.80	---	---	---
Cambria -----------	4e	---	---	---	0.80	---	---	---	0.70	---	---	---
146:												
Forkwood-----------	4e	---	---		0.90	---	---	---	0.80	---	---	---
Cushman------------	4e	---	---	---	0.80	---	---	-	0.60	---	---	---
147:												
Forkwood-----------	4e	---	---	---	---	---	---	---	---	---	---	---
Cushman------------	4e	---	---	---	---	---	---	---	---	---	---	---
148:												
Forkwood-----------	3e	---	--	---	0.90	---	---	---	0.80	---	---	---
Ulm----------------	3e	---	---	---	0.90		---	---	0.70	---	---	---
149:												
Forkwood-----------	4e	---	---	---	---	---	---	---	---	---	---	---
Ulm----------------	4e	---	---	---	---	---	---	---	---	---	---	---
150:												
Gateson------------	6e		---	---	---	---	---	---	---	---	---	---
Taluce-------------	7e	---	---	---		- -	---	---	---	---	---	---
Turnercrest--------	6e	---	---	---	---	---	---	---	---	---	---	---
151:												
Haverdad-----------	4e	---	---	---	---	---	---	---	---	---	---	---
152:												
Haverdad-----------	4e		---	---	---	---	---	---	---	---	---	---
Clarkelen----------	4e	---	---	---		---	---	---	---	---	---	---

Land Capability and Yields per Acre of Crops and Pasture--Continued

Map symbol and soil name	Land capability		Barley		Grass hay		Oats		Pasture		Winter wheat	
	N	I	N	I	N	I	N	I	N	I	N	I
			Bu	Bu	Tons	Tons	Bu	Bu	AUM	AUM	Bu	Bu
153:												
Haverdad-----------	4e	---		---	---	---	---	---	---	---	---	---
Kishona------ --	4e	---	---	---	---	---	---	---	---	---	---	---
154:												
Heldt-------------	4s	---	---	---	---	---	---	---	---	---	---	---
155:												
Heldt, saline------	4s	---	---	---	---	---	---	---	---	---	---	---
Bidman, saline-----	4s	---	---		---	---	---	---	---	---	---	---
156:												
Hiland----------	4e	---	---	---	0.80	---	---	---	0.70	---	---	---
157:												
Hiland------------	4e	---	---	---	0.80	---	---	---	0.70		---	---
Bowbac------------	4e	---	---	---	0.80	---		---	0.60	---	---	---
158:												
Hiland------------	4e	---	---	---	---	---	---	---	---	---	---	---
Bowbac -------	4e	---	---	---	---	---	---	---	---	---	---	---
159:												
Hiland------------	4e	---	---	---	0.80	---	---	---	0.70	---	---	---
Vonalee-----------	4e	---	---	---	0.80		---	---	0.70	---	---	---
160:												
Hiland------ ----	4e	---	---	---	---	---	---	---	---	---	---	---
Vonalee-----------	4e	---	---	---	---	---	---	---	---	-	---	---
161:												
Hilight-----------	7e	---	---	---	---	---	---	---	---	---	---	---
Taluce, cool-------	7e	---	---	---	---	---	---	---	---	---	---	---
Wags--------------	6e	---	---	---	---	---	---	---	---	---	---	---

Land Capability and Yields per Acre of Crops and Pasture--Continued

Map symbol and soil name	Land capability		Barley		Grass hay		Oats		Pasture		Winter wheat	
	N	I	N	I	N	I	N	I	N	I	N	I
			Bu	Bu	Tons	Tons	Bu	Bu	AUM	AUM	Bu	Bu
162:												
Lismas	7e	---	---		--	---	---	---	---	---	---	---
Mittenbutte, cool	7e	---	---	---	---	---	---	---	---	---	---	---
Sabatka	6e	---	---	---	---	---	---	---	---	---	---	---
163:												
Hilight	7e	---	---	---	---	---	---	---	---	---	---	---
Wags	6e	---	---	---	---	---	---	--				---
Badland	8s	---	---	---	---	---	---	---	---	---	---	---
164:												
Lismas	7e	---	---	---	---	---	---	---	---	---	---	---
Sabatka	6e	---	---	---	---	---	---	---	---	---	---	---
Badland	8s	---	---	---	---	---	---	---	---	---	---	---
165:												
Jayem	4e	---	---	---	---	---	---	-		-	---	---
166:												
Jaywest	3e	---	35.00	---	1.30	---	40.00	---	0.80	---	31.00	---
167:												
Jaywest	3e	---	35.00	---	1.30	---	40.00	---	0.80	---	31.00	---
Moorhead	3e	---	35.00	---	1.30	---	40.00	---	0.80	---	31.00	---
168:												
Jaywest	3e	---	---	---	1.30	---	---	---	0.80	---	---	---
Spottedhorse	4e	---	---	---	1.10	---	---	---	0.70	---	---	---
169:												
Julesburg	3e	---	---	---	0.90	---	---	---	0.80	---	---	---

Land Capability and Yields per Acre of Crops and Pasture--Continued

Map symbol and soil name	Land capability N	Land capability I	Barley N	Barley I	Grass hay N	Grass hay I	Oats N	Oats I	Pasture N	Pasture I	Winter wheat N	Winter wheat I
			Bu	Bu	Tons	Tons	Bu	Bu	AUM	AUM	Bu	Bu
170:												
Keeline------------	4e	---		---	---	---	---	---	---	---	---	---
Tullock------------	6e	---	---	---	---	---	---	---	---	---	---	---
171:												
Keeline------------	4e	---	---	---	---	---	---	---	---	---	---	---
Tullock------------	6e	---	---	---	---	---	---	---	---	---	---	---
Niobrara, dry------	7e	---	---	-	---	---	---	---	---	---	---	---
172:												
Keyner ------------	4s	---	---	---	---	---	---	---	---	---	---	---
173:												
Lawver-------------	4e	---	---	---	---	---	---	---	---	---	---	---
Teckla-------------	4e	---	---	---	---	---	---	---	---	---	---	---
Wibaux-------------	7s	---	---	---	--	--	---	---	---	---	---	---
174:												
Brislawn ----------	4e	---	---	---	---	---	---	---	---	---	---	---
Rockybutte---------	4e	---	---	---	---	---	---	---	---	---	---	---
Ironbutte----------	7s	---	---	---	---	---	---	--	---	---	---	---
175:												
Lawver-------------	4e	--	---	---	---	---	---	---	---	---	---	---
Wibaux-------------	7s	---	---	---	---	---	---	---	---	---	---	---
176:												
Leiter-------------	4e	---	---	---	---	---	---	---	-	---	---	---
Cromack------------	4e	---	---	---	-	--	---	---	---	---	---	---
177:												
Maysdorf-----------	4e	---	---	---	0.80	---	---	---	0.70	---	---	---

Land Capability and Yields per Acre of Crops and Pasture--Continued

Map symbol and soil name	Land capability N	Land capability I	Barley N	Barley I	Grass hay N	Grass hay I	Oats N	Oats I	Pasture N	Pasture I	Winter wheat N	Winter wheat I
			Bu	Bu	Tons	Tons	Bu	Bu	AUM	AUM	Bu	Bu
178:												
Maysdorf-----------	4e	---	---	---	---	---	---	---	---	---	---	---
179:												
Maysdorf-----------	4e	---	---	---	---	---	---	---	---	---	---	---
Pugsley------------	4e	---	---	---	---	---	---	---	---	---	---	---
180:												
Maysdorf-----------	4e	---	---	---	---	---	---	---	---	---	---	---
Pugsley------------	4e	---	---	---	---	---	---	---	---	---	---	---
181:												
Moorhead-----------	3e	---	35.00	---	1.30	---	40.00	---	0.80	---	31.00	---
182:												
Moorhead-----------	3e	---	35.00	---	1.30	---	40.00	---	0.80	---	31.00	---
183:												
Moorhead-----------	3e	---	---	---	1.30	---	---	---	0.80	---	---	---
Leiter-------------	4e	---	---	---	1.00	---	---	---	0.70	---	---	---
184:												
Moorhead-----------	4e	---	---	---	---	---	---	---	---	---	---	---
Leiter-------------	4e	---	---	---	---	---	---	---	---	---	---	---
185:												
Moskee-------------	3e	---	35.00	---	1.10	---	34.00	---	0.80	---	32.00	---
186:												
Moskee -----	4e	---	---	---	---	---	---	---	---	---	---	
187:												
Nuncho-------------	3e	---	32.00	---	1.10	---	37.00	---	0.80	---	30.00	---
188:												
Orpha--------------	6e	---	---	---	---	---	---	---	---	---	---	---
Tullock------------	6e	---	---	---	---	---	---	---	---	---	---	---

Land Capability and Yields per Acre of Crops and Pasture--Continued

Map symbol and soil name	Land capability		Barley		Grass hay		Oats		Pasture		Winter wheat	
	N	I	N	I	N	I	N	I	N	I	N	I
			Bu	Bu	Tons	Tons	Bu	Bu	AUM	AUM	Bu	Bu
189:												
Oshoto	3e	---	---	---	1.20	---	---	---	0.80	---	---	---
Moorhead	3e	---	---	-	1.30	-	---	---	0.80	---	---	---
190:												
Parmleed	4e	---	---	---	---	---	---	---	---	---	---	---
Renohill	4e	---	---	---	---	---	---	---	---	---	---	---
191:												
Pits	---	---	---	---	---	---	---	---	---	- -	---	---
Dumps	---	---	---	---	---	---	---	---	-	---	---	---
192:												
Platmak	3e	---	32.00	-	1.10	---	37.00	---	0.80	---	30.00	---
193:												
Pugsley	4e	---	---	---	---	---	---	---	---	---	---	---
Decolney	4e	---	---	---	---	---	---	---	---	---	---	---
194:												
Pugsley	4e	---	---	---	---	---	---	--	-	---	---	---
Decolney	4e	---	---	---		---	---	---	---	---	---	---
195:												
Rauzi	3e	---	---	---	1.20	---	---	---	0.80	---	---	---
196:												
Rauzi	3e	---	---	---	1.20	---	---	---	0.80	---	-	---
197:												
Rauzi	4e	---	---	---	---	---	---	---	---	---	---	---
Elwop	4e	---	--	---	---	---	---	---	---	---	---	---
198:												
Recluse	3e	---	35.00	---	1.10	---	38.00	---	0.80	---	32.00	---

Land Capability and Yields per Acre of Crops and Pasture--Continued

Map symbol and soil name	Land capability		Barley		Grass hay		Oats		Pasture		Winter wheat	
	N	I	N	I	N	I	N	I	N	I	N	I
			Bu	Bu	Tons	Tons	Bu	Bu	AUM	AUM	Bu	Bu
199:												
Renohill	4e	---	---	---	---	---	---	---	---	---	---	---
Savageton	4e	---	---	---	---	---	---	---	---	---	---	---
200:												
Renohill	4e	---	---	---	---	---	---	---	---	---	---	---
Savageton	4e	---	---		---	---	---	---	---	---	---	---
201:												
Renohill	4e	---	---	---	---	---	---	---	---	---	---	---
Shingle	7e	---	---	---	---	---	---	---	---	---	---	---
Worf	7e	---	---	---	---	---	---	---	---	---	---	---
202:												
Renohill	4e	---	---	---	---	---	---	---	---	---	---	---
Worfka	7e	---	---	---	---	---	---	---	---	---	---	---
203:												
Rockypoint	4e	---	---	---	---	---	---	---	---	---	---	---
Iwait	4e	---	---	---	---	---	---	---	---	---	---	---
204:												
Samday	7e	---		---	---	---	---	---	---	---	---	---
Samday, cool	7e	---	---	---	---	---	---	---	---	---	---	---
Shingle	7e	---	---	---	---	---	---	---	---	---	---	---
205:												
Samday	7e	---	---	---	---	---	---	---	---	---	---	---
Savageton	4e	---	---	---	---	---	---	---	---	---	---	---
206:												
Samday	6e	---	---	---	---	---	---	---	---	---	---	---
Shingle	6e	---	---	---	---	---	---	---	---	---	---	---
Badland	8s	---	---	---	---	---	---	---	---	---	---	---

Land Capability and Yields per Acre of Crops and Pasture--Continued

Map symbol and soil name	Land capability		Barley		Grass hay		Oats		Pasture		Winter wheat	
	N	I	N	I	N	I	N	I	N	I	N	I
			Bu	Bu	Tons	Tons	Bu	Bu	AUM	AUM	Bu	Bu
207:												
Cromack	4e	---	---	---	---	---	---	---	---	---	---	---
Fairburn	7e	--	---	---	---	---	---	---	---	---	---	---
Ucross	4e	---	---	---	---	---	---	---	---	---	---	---
208:												
Savageton	4e	---	---	---	---	---	---	---		---	---	---
Silhouette	4e	---	---	---	---	---	---	---	---	---	---	---
209:												
Savageton	4e	---		---	---	---	---	---	---	---	---	---
Silhouette	4e	---	---	---	---	---	---	---	---	---	---	---
210:												
Shingle	7e	---	---	---	---	---	---	---	---	---	---	---
Taluce	7e	---	---	---	---	---	---	---	---	---	---	---
211:												
Shingle	7e	---	-	---	---	---	---	---	---	---	---	---
Worf	7e	---	---	---	---	---	---	---	---	---	---	---
212:												
Teckla	4e	---	---	---	---	---	---	---	---	---	---	---
213:												
Terro	6e	---	---	--	---	---	---	---	---	---	---	---
Taluce	7e	---	---	---	---	---	---	---	---	---	---	--
214:												
Theedle	4e	---	---	---	---	---	---	---	---	---	---	---
Kishona	4e	---	---	---	-	---	---	---	---	---	---	---
215:												
Theedle	6e	---	---	---	---	---	---	---	---	---	---	---
Kishona	4e	---	---	---	---	---	---	---	---	---	---	---

Land Capability and Yields per Acre of Crops and Pasture--Continued

Map symbol and soil name	Land capability		Barley		Grass hay		Oats		Pasture		Winter wheat	
	N	I	N	I	N	I	N	I	N	I	N	I
			Bu	Bu	Tons	Tons	Bu	Bu	AUM	AUM	Bu	Bu
216:												
Theedle------------	6e	---	---	---	---	---	---	---	---	---	---	---
Kishona------------	4e	---	---	---	---	---	---	---	---	---	---	---
Shingle------------	7e	---	---	---	---	---	---	---	---	---	---	---
217:												
Theedle------------	6e	---	---	---	---	---	---	---	---	---	---	---
Shingle------------	7e	---	---	---	---	---	---	---	---	---	---	---
218:												
Theedle------------	4e	---	---	---	---	---	---	---	---	---	---	---
Turnercrest--------	6e	---	---	---	---	---	---	---	---	---	---	---
Kishona------------	4e	---	---	---	---	---	---	---	---	---	---	---
219:												
Torriarents--------	6e	---	---	---	---	---	---	---	---	---	---	---
Torriorthents------	6e	---	---	---	---	---	---	---	---	---	---	---
220:												
Pitchdraw----------	6e	---	---	---	---	---	---	---	---	---	---	---
Ashollow-----------	4e	---	---	---	---	---	---	---	---	---	---	---
Niobrara-----------	7e	---	---	---	---	---	---	---	---		--	---
221:												
Turnercrest--------	6e	---	---	---	---	---	---	---	---	---	---	---
Keeline------------	4e	---	---	---	---	---	---	---	---	---	---	---
Taluce-------------	7e	---	---	---	---	---	---	---	---	---	---	---
222:												
Turnercrest--------	6e	---	---	---	---	---	---	---	---	---	---	---
Wibaux, thin solum-	7s	---	---	---	---	---	---	---	---	---	---	---
Taluce-------------	7e	---	---	---	---	---	---	---	---	---	---	---

Land Capability and Yields per Acre of Crops and Pasture--Continued

Map symbol and soil name	Land capability		Barley		Grass hay		Oats		Pasture		Winter wheat	
	N	I	N	I	N	I	N	I	N	I	N	I
			Bu	Bu	Tons	Tons	Bu	Bu	AUM	AUM	Bu	Bu
223:												
Ucross-------------	4e	---	---	---	0.80	---	---	---	0.60	---	---	---
224:												
Ucross-------------	4e	---	---	---	0.80	---	---	-	0.60	---	---	---
Iwait--------------	4e	---	---	---	1.10	---	---	---	0.70	---	---	---
225:												
Ucross-------------	4e	---	---	---	---	---	---	---	---	---	---	---
Iwait--------------	4e	---	---	---	---	---	---	---	---	---	---	--
Fairburn-----------	7e	---	---	---	---	---	---	---	---		---	---
226:												
Ulm----------------	4e	---	---	---	0.90	---	---	--	0.70	---	---	---
227:												
Ulm----------------	4e	---	---	---	0.90	---	---	---	0.70	---	---	---
228:												
Ulm----------------	3e	-	---	---	---	---	---	---	---	---	---	---
Renohill- --------	4e	---	---	---	---	---	---	---	---	---	---	---
229:												
Ulm----------------	4e	---	---	---	---	--	---	---	---	---	---	---
Renohill-----------	4e	---	---	-	---	---	---	---	---	---	---	---
230:												
Urban land---------	---	--	---	---	---	---	---	---	---	-	---	---
Deekay ------------	3e	---	---	---	---	---	---	--	---	---	---	---
Moorhead-----------	3e	---	---	---	---	--	---	---	---	---	---	---
231:												
Urban land---------	---	---	---	---	---	---	---	---	---	---		---
Leiter-------- ----	4e	---	---	---	---	---	---	---	-	---	---	---
Moorhead-----------	4e	---	---	---	---	---		---	---	---	---	---

Land Capability and Yields per Acre of Crops and Pasture--Continued

Map symbol and soil name	Land capability N	Land capability I	Barley N	Barley I	Grass hay N	Grass hay I	Oats N	Oats I	Pasture N	Pasture I	Winter wheat N	Winter wheat I
			Bu	Bu	Tons	Tons	Bu	Bu	AUM	AUM	Bu	Bu
232:												
Urban land---------	---	---	---	---	---	---	---	---	---	---	---	---
Pitchdraw----------	6e	---	---	---	---	---	---	---	---	---	---	---
Ashollow-----------	4e	---	---	---	---	---	---	---	---	---	---	---
233:												
Ustic Torriorthents	7e	---	---	---	---	---	---	---	---	---	---	---
234:												
Ustic Torriorthents	7e	---	---	---	---	---	---	---	---	---	---	---
Badland------------	8s	---	---	---	---	---	---	---	---	---	---	---
235:												
Vonalee------------	4e	---	---	---	0.80	---	---	---	0.70	---	---	---
236:												
Vonalee------------	4e	---	---	---	---	---	---	---	---	---	---	---
Terro--------------	6e	---	---	---	---	---	---	---	---	---	---	---
237:												
Vonalf-------------	3e	---	---	---	1.20	---	---	---	0.80	---	---	---
238:												
Vonalf-------------	4e	---	---	---	---	---	---	---	---	---	---	---
Xema---------------	4e	---	---	---	---	---	---	---	---	---	---	---
239:												
Ironbutte----------	7s	---	---	---	---	---	---	---	---	---	---	---
Fairburn-----------	7e	---	---	---	---	---	---	---	---	--	---	---
Mittenbutte--------	7e	---	---	---	---	---	---	---	---	---	---	---
240:												
Wibaux-------------	7s	---	---	---	---	---	---	---	---	---	---	---
Wibaux, thin solum-	7s	---	---	---	---	---	---	---	---	---	---	---

Land Capability and Yields per Acre of Crops and Pasture--Continued

Map symbol and soil name	Land capability N	Land capability I	Barley N	Barley I	Grass hay N	Grass hay I	Oats N	Oats I	Pasture N	Pasture I	Winter wheat N	Winter wheat I
			Bu	Bu	Tons	Tons	Bu	Bu	AUM	AUM	Bu	Bu
241:												
Ironbutte----------	7s	---	---	---	---	---	---	---	---	---	---	---
Ironbutte, thin solum------------	7s	---	---	---	---	---	---	---	---	---	---	---
242:												
Ironbutte----------	7s	---	---	---	---	---	---	---	---	---	---	---
Deekay-------------	4e	---	---	---	---	---	---	---	---	---	---	---
Moorhead-----------	4e	---	---	---	---	---	---	---	---	---	---	---
243:												
Wibaux, thick solum	6s	---	---	---	---	--	---	---	---	---	---	---
Wibaux-------------	7s	---	---	---	---	---	---	---	---	---	---	---
244:												
Muleherder---------	6s	---	---	---	---	---	---	---	---	---	---	-
Ironbutte----------	7s	---	---	---	---	---	---	---		---	---	---
245:												
Wibaux-------------	7s	---	---	---	---	-	---	---	---	---	---	---
Shingle------------	7e	---	---		---	---	---	---	---	---	---	---
Badland------------	---	---	---	---	---	---	---	---	---	---	---	---
246:												
Wyarno-------------	4e	---	---	---	---	---	---	---	---	---	---	---
Ulm----------------	4e	---	---	---		---	---	---	---	---	---	---
247:												
Wyotite-------- ---	4e	---	---	---	---	---	---	---	---	---	---	---
Ulm----------------	4e	---	---	---	---	---	---	---	---	---	---	---
248:												
Ziggy--------------	4e	---	---	---	1.10	---	---	---	0.70	---	---	---
Iwait--------------	4e	---	---	---	1.10	---	---	---	0.70	---	---	---

Land Capability and Yields per Acre of Crops and Pasture--Continued

Map symbol and soil name	Land capability		Barley		Grass hay		Oats		Pasture		Winter wheat	
	N	I	N	I	N	I	N	I	N	I	N	I
			Bu	Bu	Tons	Tons	Bu	Bu	AUM	AUM	Bu	Bu
249:												
Ziggy	4e	---	---	---	---	---	---	---	---	---	---	---
Iwait	4e	---	---	---	---	---	---	---	---	---	---	---
250:												
Ziggy	4e	---	--		---	---	---	---	---	---	---	---
Ucross	4e	---	---	---	---	---	---	---		---	---	---
Oldwolf	4e	---	---	---	---	---	---	---	---	---	---	---

Rangeland Productivity and Characteristic Plant Communities

(Only the soils that support rangeland vegetation suitable for grazing are rated.)

Map symbol and soil name	Ecological site	Total dry-weight production: Favorable year	Normal year	Unfavorable year	Characteristic vegetation	Rangeland composition
		Lb/acre	Lb/acre	Lb/acre		Pct
100:						
Aridic Ustorthents, saline	Loamy (15-17np)	2,300	1,900	1,500	green needlegrass	25
					western wheatgrass	25
					needleandthread	20
					big bluestem	10
					big sagebrush	10
					blue grama	10
					Sandberg bluegrass	5
101:						
Arvada, thick surface	Loamy (10-14np)	1,500	1,200	700	needleandthread	25
					western wheatgrass	25
					blue grama	15
					green needlegrass	15
					Cusick's bluegrass	10
					big sagebrush	10
102:						
Arvada, thick surface	Loamy (10-14np)	1,500	1,200	700	needleandthread	25
					western wheatgrass	25
					blue grama	15
					green needlegrass	15
					Cusick's bluegrass	10
					big sagebrush	10
Arvada	Saline Upland (10-14np)	650	500	250	gardner saltbush	50
					inland saltgrass	15
					Indian ricegrass	10
					alkali sacaton	10
					bottlebrush squirreltail	10
					greasewood	10
					western wheatgrass	10
Slickspots	---	---	---	---	---	---
103:						
Arwite	Sandy (15-17np)	2,400	2,000	1,600	needleandthread	25
					prairie sandreed	25
					Indian ricegrass	10
					little bluestem	10
					silver sagebrush	5
					threadleaf sedge	5
					western wheatgrass	5
104:						
Arwite	Sandy (15-17np)	2,400	2,000	1,600	needleandthread	25
					prairie sandreed	25
					Indian ricegrass	10
					little bluestem	10
					silver sagebrush	5
					threadleaf sedge	5
					western wheatgrass	5

Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production: Favorable year	Normal year	Unfavorable year	Characteristic vegetation	Rangeland composition
		Lb/acre	Lb/acre	Lb/acre		Pct
105:						
Arwite	Sandy (15-17np)	2,400	2,000	1,600	needleandthread	25
					prairie sandreed	25
					Indian ricegrass	10
					little bluestem	10
					silver sagebrush	5
					threadleaf sedge	5
					western wheatgrass	5
Elwop	Sandy (15-17np)	2,400	2,000	1,600	needleandthread	25
					prairie sandreed	25
					Indian ricegrass	10
					little bluestem	10
					silver sagebrush	5
					threadleaf sedge	5
					western wheatgrass	5
106:						
Arwite	Sandy (15-17np)	2,400	2,000	1,600	needleandthread	25
					prairie sandreed	25
					Indian ricegrass	10
					little bluestem	10
					silver sagebrush	5
					threadleaf sedge	5
					western wheatgrass	5
Elwop	Sandy (15-17np)	2,400	2,000	1,600	needleandthread	25
					prairie sandreed	25
					Indian ricegrass	10
					little bluestem	10
					silver sagebrush	5
					threadleaf sedge	5
					western wheatgrass	5
107:						
Arwite	Sandy (15-17np)	2,400	2,000	1,600	needleandthread	25
					prairie sandreed	25
					Indian ricegrass	10
					little bluestem	10
					silver sagebrush	5
					threadleaf sedge	5
					western wheatgrass	5
Vonalf	Sandy (15-17np)	2,400	2,000	1,600	needleandthread	25
					prairie sandreed	25
					Indian ricegrass	10
					little bluestem	10
					silver sagebrush	5
					threadleaf sedge	5
					western wheatgrass	5
108:						
Arwite	Sandy (15-17np)	2,400	2,000	1,600	needleandthread	25
					prairie sandreed	25
					Indian ricegrass	10
					little bluestem	10
					silver sagebrush	5
					threadleaf sedge	5
					western wheatgrass	5

Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production: Favorable year	Normal year	Unfavorable year	Characteristic vegetation	Rangeland composition
		Lb/acre	Lb/acre	Lb/acre		Pct
108:(cont.)						
Vonalf----------------	Sandy (15-17np)	2,400	2,000	1,600	needleandthread------------	25
					prairie sandreed-----------	25
					Indian ricegrass-----------	10
					little bluestem------------	10
					silver sagebrush-----------	5
					threadleaf sedge-----------	5
					western wheatgrass---------	5
109:						
Bidman----------------	Loamy (10-14np)	1,500	1,200	700	needleandthread------------	25
					western wheatgrass---------	25
					blue grama-----------------	15
					green needlegrass----------	15
					big sagebrush--------------	10
					Cusick's bluegrass---------	5
110:						
Bidman, loamy substratum-----------	Loamy (10-14np)	1,500	1,200	700	needleandthread------------	25
					western wheatgrass---------	25
					blue grama-----------------	15
					green needlegrass----------	15
					big sagebrush--------------	10
					Cusick's bluegrass---------	5
111:						
Bidman----------------	Loamy (10-14np)	1,500	1,200	700	needleandthread------------	25
					western wheatgrass---------	25
					blue grama-----------------	15
					green needlegrass----------	15
					big sagebrush--------------	10
					Cusick's bluegrass---------	5
Parmleed--------------	Loamy (10-14np)	1,500	1,200	700	needleandthread------------	25
					western wheatgrass---------	25
					blue grama-----------------	15
					green needlegrass----------	15
					big sagebrush--------------	10
					Cusick's bluegrass---------	5
112:						
Bidman----------------	Loamy (10-14np)	1,500	1,200	700	needleandthread------------	25
					western wheatgrass---------	25
					blue grama-----------------	15
					green needlegrass----------	15
					big sagebrush--------------	10
					Cusick's bluegrass---------	5
Parmleed--------------	Loamy (10-14np)	1,500	1,200	700	needleandthread------------	25
					western wheatgrass---------	25
					blue grama-----------------	15
					green needlegrass----------	15
					big sagebrush--------------	10
					Cusick's bluegrass---------	5
113:						
Bidman----------------	Loamy (10-14np)	1,500	1,200	700	needleandthread------------	25
					western wheatgrass---------	25
					blue grama-----------------	15
					green needlegrass----------	15
					big sagebrush--------------	10
					Cusick's bluegrass---------	5

Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production: Favorable year	Total dry-weight production: Normal year	Total dry-weight production: Unfavorable year	Characteristic vegetation	Rangeland composition
		Lb/acre	Lb/acre	Lb/acre		Pct
113:(cont.)						
Ulm	Loamy (10-14np)	1,500	1,200	700	needleandthread	25
					western wheatgrass	25
					blue grama	15
					green needlegrass	15
					big sagebrush	10
					Cusick's bluegrass	5
114:						
Bowbac	Sandy (10-14np)	1,600	1,300	750	needleandthread	25
					prairie sandreed	20
					Indian ricegrass	15
					little bluestem	10
					threadleaf sedge	10
					western wheatgrass	10
					blue grama	5
					silver sagebrush	5
Taluce	Shallow Sandy (10-14np)	1,300	1,000	600	needleandthread	25
					prairie sandreed	20
					blue grama	10
					bluebunch wheatgrass	10
					little bluestem	10
					ponderosa pine	5
					threadleaf sedge	5
Badland	---	---	---	---	---	---
115:						
Bowbac	Sandy (10-14np)	1,600	1,300	750	needleandthread	25
					prairie sandreed	20
					Indian ricegrass	15
					little bluestem	10
					threadleaf sedge	10
					western wheatgrass	10
					blue grama	5
					silver sagebrush	5
Worf	Shallow Sandy (10-14np)	1,300	1,000	600	needleandthread	25
					prairie sandreed	20
					bluebunch wheatgrass	10
					little bluestem	10
					blue grama	5
					threadleaf sedge	5
116:						
Cambria	Loamy (10-14np)	1,500	1,200	700	needleandthread	25
					western wheatgrass	25
					blue grama	15
					green needlegrass	15
					big sagebrush	10
					Cusick's bluegrass	5
Kishona	Loamy (10-14np)	1,500	1,200	700	needleandthread	25
					western wheatgrass	25
					blue grama	15
					green needlegrass	15
					big sagebrush	10
					Cusick's bluegrass	5

Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production: Favorable year	Normal year	Unfavorable year	Characteristic vegetation	Rangeland composition
		Lb/acre	Lb/acre	Lb/acre		Pct
116: (cont.)						
Zigweid	Loamy (10-14np)	1,500	1,200	700	needleandthread	25
					western wheatgrass	25
					blue grama	15
					green needlegrass	15
					big sagebrush	10
					Cusick's bluegrass	5
117:						
Cambria	Loamy (10-14np)	1,500	1,200	700	needleandthread	25
					western wheatgrass	25
					blue grama	15
					green needlegrass	15
					big sagebrush	10
					Cusick's bluegrass	5
Kishona	Loamy (10-14np)	1,500	1,200	700	needleandthread	25
					western wheatgrass	25
					blue grama	15
					green needlegrass	15
					big sagebrush	10
					Cusick's bluegrass	5
Zigweid	Loamy (10-14np)	1,500	1,200	700	needleandthread	25
					western wheatgrass	25
					blue grama	15
					green needlegrass	15
					big sagebrush	10
					Cusick's bluegrass	5
118:						
Clarkelen	Lowland (10-14np)	3,000	2,300	1,600	green needlegrass	25
					cottonwood	10
					needleandthread	10
					slender wheatgrass	10
					western wheatgrass	10
					Sandberg bluegrass	5
					snowberry	5
Draknab	Lowland (10-14np)	3,000	2,300	1,600	green needlegrass	25
					cottonwood	10
					needleandthread	10
					slender wheatgrass	10
					western wheatgrass	10
					Sandberg bluegrass	5
					snowberry	5
119:						
Clarkelen	Lowland (10-14np)	3,000	2,300	1,600	green needlegrass	25
					cottonwood	10
					needleandthread	10
					slender wheatgrass	10
					western wheatgrass	10
					Sandberg bluegrass	5
					snowberry	5

Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production: Favorable year	Normal year	Unfavorable year	Characteristic vegetation	Rangeland composition
		Lb/acre	Lb/acre	Lb/acre		Pct
119: (cont.)						
Embry	Sandy (10-14np)	1,600	1,300	750	needleandthread	25
					prairie sandreed	20
					Indian ricegrass	15
					little bluestem	10
					silver sagebrush	10
					threadleaf sedge	10
					western wheatgrass	10
					blue grama	5
120:						
Clarkelen	Lowland (10-14np)	3,000	2,300	1,600	green needlegrass	25
					cottonwood	10
					needleandthread	10
					slender wheatgrass	10
					western wheatgrass	10
					Sandberg bluegrass	5
					snowberry	5
Keeline	Sandy (10-14np)	1,600	1,300	750	needleandthread	25
					prairie sandreed	20
					Indian ricegrass	15
					little bluestem	10
					threadleaf sedge	10
					western wheatgrass	10
					blue grama	5
					silver sagebrush	5
121:						
Cushman	Loamy (10-14np)	1,500	1,200	700	needleandthread	25
					western wheatgrass	25
					blue grama	15
					green needlegrass	15
					big sagebrush	10
					Cusick's bluegrass	5
Cambria	Loamy (10-14np)	1,500	1,200	700	needleandthread	25
					western wheatgrass	25
					blue grama	15
					green needlegrass	15
					big sagebrush	10
					Cusick's bluegrass	5
122:						
Cushman	Loamy (10-14np)	1,500	1,200	700	needleandthread	25
					western wheatgrass	25
					blue grama	15
					green needlegrass	15
					big sagebrush	10
					Cusick's bluegrass	5
Cambria	Loamy (10-14np)	1,500	1,200	700	needleandthread	25
					western wheatgrass	25
					blue grama	15
					green needlegrass	15
					big sagebrush	10
					Cusick's bluegrass	5

Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production: Favorable year	Normal year	Unfavorable year	Characteristic vegetation	Rangeland composition
		Lb/acre	Lb/acre	Lb/acre		Pct
123:						
Cushman	Loamy (10-14np)	1,500	1,200	700	needleandthread	25
					western wheatgrass	25
					blue grama	15
					green needlegrass	15
					big sagebrush	10
					Cusick's bluegrass	5
Renohill	Clayey (10-14np)	1,400	1,000	600	green needlegrass	40
					western wheatgrass	40
					Cusick's bluegrass	10
					big sagebrush	10
					blue grama	10
124:						
Cushman	Loamy (10-14np)	1,500	1,200	700	needleandthread	25
					western wheatgrass	25
					blue grama	15
					green needlegrass	15
					big sagebrush	10
					Cusick's bluegrass	5
Shingle	Shallow Loamy (10-14np)	1,200	900	450	bluebunch wheatgrass	50
					western wheatgrass	15
					blue grama	10
					little bluestem	10
					needleandthread	10
					threadleaf sedge	10
					big sagebrush	5
					green needlegrass	5
125:						
Cushman	Loamy (10-14np)	1,500	1,200	700	needleandthread	25
					western wheatgrass	25
					blue grama	15
					green needlegrass	15
					big sagebrush	10
					Cusick's bluegrass	5
Terro	Sandy (10-14np)	1,600	1,300	750	needleandthread	25
					prairie sandreed	20
					Indian ricegrass	15
					little bluestem	10
					threadleaf sedge	10
					western wheatgrass	10
					blue grama	5
					silver sagebrush	5
126:						
Cushman	Loamy (10-14np)	1,500	1,200	700	needleandthread	25
					western wheatgrass	25
					blue grama	15
					green needlegrass	15
					big sagebrush	10
					Cusick's bluegrass	5

Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production: Favorable year	Normal year	Unfavorable year	Characteristic vegetation	Rangeland composition
		Lb/acre	Lb/acre	Lb/acre		Pct
126: (cont.)						
Theedle	Loamy (10-14np)	1,500	1,200	700	needleandthread	25
					western wheatgrass	25
					blue grama	15
					green needlegrass	15
					big sagebrush	10
					Cusick's bluegrass	5
127:						
Cushman	Loamy (10-14np)	1,500	1,200	700	needleandthread	25
					western wheatgrass	25
					blue grama	15
					green needlegrass	15
					big sagebrush	10
					Cusick's bluegrass	5
Theedle	Loamy (10-14np)	1,500	1,200	700	needleandthread	25
					western wheatgrass	25
					blue grama	15
					green needlegrass	15
					big sagebrush	10
					Cusick's bluegrass	5
128:						
Cushman	Loamy (10-14np)	1,500	1,200	700	needleandthread	25
					western wheatgrass	25
					blue grama	15
					green needlegrass	15
					big sagebrush	10
					Cusick's bluegrass	5
Worf	Shallow Loamy (10-14np)	1,200	900	450	bluebunch wheatgrass	50
					western wheatgrass	15
					blue grama	10
					little bluestem	10
					needleandthread	10
					threadleaf sedge	10
					big sagebrush	5
					green needlegrass	5
129:						
Decolney	Sandy (10-14np)	1,600	1,300	750	needleandthread	25
					prairie sandreed	20
					Indian ricegrass	15
					little bluestem	10
					threadleaf sedge	10
					western wheatgrass	10
					blue grama	5
					silver sagebrush	5
Hiland	Sandy (10-14np)	1,600	1,300	750	needleandthread	25
					prairie sandreed	20
					Indian ricegrass	15
					little bluestem	10
					threadleaf sedge	10
					western wheatgrass	10
					blue grama	5
					silver sagebrush	5

Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production: Favorable year	Normal year	Unfavorable year	Characteristic vegetation	Rangeland composition
		Lb/acre	Lb/acre	Lb/acre		Pct
130:						
Decolney	Sandy (10-14np)	1,600	1,300	750	needleandthread	25
					prairie sandreed	20
					Indian ricegrass	15
					little bluestem	10
					threadleaf sedge	10
					western wheatgrass	10
					blue grama	5
					silver sagebrush	5
Hiland	Sandy (10-14np)	1,600	1,300	750	needleandthread	25
					prairie sandreed	20
					Indian ricegrass	15
					little bluestem	10
					threadleaf sedge	10
					western wheatgrass	10
					blue grama	5
					silver sagebrush	5
131:						
Deekay	Loamy (15-17np)	2,300	1,900	1,500	green needlegrass	25
					western wheatgrass	25
					needleandthread	20
					big bluestem	10
					big sagebrush	10
					blue grama	10
					Sandberg bluegrass	5
132:						
Deekay	Loamy (15-17np)	2,300	1,900	1,500	green needlegrass	25
					western wheatgrass	25
					needleandthread	20
					big bluestem	10
					big sagebrush	10
					blue grama	10
					Sandberg bluegrass	5
Moorhead	Loamy (15-17np)	2,300	1,900	1,500	green needlegrass	25
					western wheatgrass	25
					needleandthread	20
					big bluestem	10
					big sagebrush	10
					blue grama	10
					Sandberg bluegrass	5
133:						
Deekay	Loamy (15-17np)	2,300	1,900	1,500	green needlegrass	25
					western wheatgrass	25
					needleandthread	20
					big bluestem	10
					big sagebrush	10
					blue grama	10
					Sandberg bluegrass	5
Moorhead	Loamy (15-17np)	2,300	1,900	1,500	green needlegrass	25
					western wheatgrass	25
					needleandthread	20
					big bluestem	10
					big sagebrush	10
					blue grama	10
					Sandberg bluegrass	5

Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production Favorable year	Normal year	Unfavorable year	Characteristic vegetation	Rangeland composition
		Lb/acre	Lb/acre	Lb/acre		Pct
134:						
Deekay	Loamy (15-17np)	2,300	1,900	1,500	green needlegrass	25
					western wheatgrass	25
					needleandthread	20
					big bluestem	10
					big sagebrush	10
					blue grama	10
					Sandberg bluegrass	5
Oldwolf	Loamy (15-17np)	2,300	1,900	1,500	green needlegrass	25
					western wheatgrass	25
					needleandthread	20
					big bluestem	10
					big sagebrush	10
					blue grama	10
					Sandberg bluegrass	5
135:						
Deekay	Loamy (15-17np)	2,300	1,900	1,500	green needlegrass	25
					western wheatgrass	25
					needleandthread	20
					big bluestem	10
					big sagebrush	10
					blue grama	10
					Sandberg bluegrass	5
Oldwolf	Loamy (15-17np)	2,300	1,900	1,500	green needlegrass	25
					western wheatgrass	25
					needleandthread	20
					big bluestem	10
					big sagebrush	10
					blue grama	10
					Sandberg bluegrass	5
136:						
Deekay	Loamy (15-17np)	2,300	1,900	1,500	green needlegrass	25
					western wheatgrass	25
					needleandthread	20
					big bluestem	10
					big sagebrush	10
					blue grama	10
					Sandberg bluegrass	5
Ziggy	Loamy (15-17np)	2,300	1,900	1,500	green needlegrass	25
					western wheatgrass	25
					needleandthread	20
					big bluestem	10
					big sagebrush	10
					blue grama	10
					Sandberg bluegrass	5
137:						
Echeta	Clayey (15-17np)	2,300	1,900	1,500	green needlegrass	40
					western wheatgrass	30
					big bluestem	10
					big sagebrush	10
					blue grama	5
					sideoats grama	5

Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production: Favorable year	Normal year	Unfavorable year	Characteristic vegetation	Rangeland composition
		Lb/acre	Lb/acre	Lb/acre		Pct
138:						
Echeta	Clayey (15-17np)	2,300	1,900	1,500	green needlegrass	40
					western wheatgrass	30
					big bluestem	10
					big sagebrush	10
					blue grama	5
					sideoats grama	5
Cromack	Clayey (15-17np)	2,300	1,900	1,500	green needlegrass	40
					western wheatgrass	30
					big bluestem	10
					big sagebrush	10
					blue grama	5
					sideoats grama	5
139:						
Embry	Sandy (10-14np)	1,600	1,300	750	needleandthread	25
					prairie sandreed	20
					Indian ricegrass	10
					little bluestem	10
					western wheatgrass	10
					blue grama	5
					silver sagebrush	5
					threadleaf sedge	5
Orpha	Sands (10-14np)	1,700	1,400	900	prairie sandreed	50
					sand bluestem	25
					needleandthread	15
					Indian ricegrass	10
					silver sagebrush	5
					threadleaf sedge	5
140:						
Embry	Sandy (10-14np)	1,600	1,300	750	needleandthread	25
					prairie sandreed	20
					Indian ricegrass	10
					little bluestem	10
					western wheatgrass	10
					blue grama	5
					silver sagebrush	5
					threadleaf sedge	5
Taluce	Shallow Sandy (10-14np)	1,300	1,000	600	needleandthread	25
					prairie sandreed	20
					bluebunch wheatgrass	10
					little bluestem	10
					blue grama	5
					ponderosa pine	5
					threadleaf sedge	5
141:						
Emigha	Loamy (10-14np)	1,500	1,200	700	needleandthread	25
					western wheatgrass	25
					blue grama	15
					green needlegrass	15
					big sagebrush	10
					Cusick's bluegrass	5

Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production: Favorable year	Normal year	Unfavorable year	Characteristic vegetation	Rangeland composition
		Lb/acre	Lb/acre	Lb/acre		Pct
142:						
Emigha, sodic	Saline Upland (10-14np)	650	500	250	gardner saltbush	50
					inland saltgrass	15
					Indian ricegrass	10
					alkali sacaton	10
					bottlebrush squirreltail	10
					greasewood	10
					western wheatgrass	10
Arvada, thick surface	Loamy (10-14np)	1,500	1,200	700	needleandthread	25
					western wheatgrass	25
					blue grama	15
					green needlegrass	15
					big sagebrush	10
					Cusick's bluegrass	5
143:						
Felix, ponded	Clayey Overflow (10-14np)	2,200	1,800	1,200	basin wildrye	50
					green needlegrass	20
					western wheatgrass	15
					Canada wildrye	10
					Cusick's bluegrass	5
					Sandberg bluegrass	5
144:						
Forkwood	Loamy (10-14np)	1,500	1,200	700	needleandthread	25
					western wheatgrass	25
					blue grama	15
					green needlegrass	15
					big sagebrush	10
					Cusick's bluegrass	5
145:						
Forkwood	Loamy (10-14np)	1,500	1,200	700	needleandthread	25
					western wheatgrass	25
					blue grama	15
					green needlegrass	15
					big sagebrush	10
					Cusick's bluegrass	5
Cambria	Loamy (10-14np)	1,500	1,200	700	needleandthread	25
					western wheatgrass	25
					blue grama	15
					green needlegrass	15
					big sagebrush	10
					Cusick's bluegrass	5
146:						
Forkwood	Loamy (10-14np)	1,500	1,200	700	needleandthread	25
					western wheatgrass	25
					blue grama	15
					green needlegrass	15
					big sagebrush	10
					Cusick's bluegrass	5
Cushman	Loamy (10-14np)	1,500	1,200	700	needleandthread	25
					western wheatgrass	25
					blue grama	15
					green needlegrass	15
					big sagebrush	10
					Cusick's bluegrass	5

Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production Favorable year	Normal year	Unfavorable year	Characteristic vegetation	Rangeland composition
		Lb/acre	Lb/acre	Lb/acre		Pct
147:						
Forkwood	Loamy (10-14np)	1,500	1,200	700	needleandthread	25
					western wheatgrass	25
					blue grama	15
					green needlegrass	15
					big sagebrush	10
					Cusick's bluegrass	5
Cushman	Loamy (10-14np)	1,500	1,200	700	needleandthread	25
					western wheatgrass	25
					blue grama	15
					green needlegrass	15
					big sagebrush	10
					Cusick's bluegrass	5
148:						
Forkwood	Loamy (10-14np)	1,500	1,200	700	needleandthread	25
					western wheatgrass	25
					blue grama	15
					green needlegrass	15
					big sagebrush	10
					Cusick's bluegrass	5
Ulm	Loamy (10-14np)	1,500	1,200	700	needleandthread	25
					western wheatgrass	25
					blue grama	15
					green needlegrass	15
					big sagebrush	10
					Cusick's bluegrass	5
149:						
Forkwood	Loamy (10-14np)	1,500	1,200	700	needleandthread	25
					western wheatgrass	25
					blue grama	15
					green needlegrass	15
					big sagebrush	10
					Cusick's bluegrass	5
Ulm	Loamy (10-14np)	1,500	1,200	700	needleandthread	25
					western wheatgrass	25
					blue grama	15
					green needlegrass	15
					big sagebrush	10
					Cusick's bluegrass	5
150:						
Gateson	Ponderosa Pine (10-17np)	500	425	300	ponderosa pine	50
					rocky mountain juniper	10
					needleandthread	5
					prairie junegrass	5
					prairie sandreed	5
					western wheatgrass	5
Taluce	Shallow Sandy (10-14np)	1,300	1,000	600	needleandthread	25
					prairie sandreed	20
					bluebunch wheatgrass	10
					little bluestem	10
					blue grama	5
					ponderosa pine	5
					threadleaf sedge	5

Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production: Favorable year	Normal year	Unfavorable year	Characteristic vegetation	Rangeland composition
		Lb/acre	Lb/acre	Lb/acre		Pct
150: (cont.)						
Turnercrest	Sandy (10-14np)	1,600	1,300	750	needleandthread	25
					prairie sandreed	20
					Indian ricegrass	10
					little bluestem	10
					western wheatgrass	10
					blue grama	5
					ponderosa pine	5
					silver sagebrush	5
151:						
Haverdad	Lowland (10-14np)	3,000	2,300	1,600	green needlegrass	25
					cottonwood	10
					needleandthread	10
					slender wheatgrass	10
					western wheatgrass	10
					Sandberg bluegrass	5
					silver sagebrush	5
					snowberry	5
152:						
Haverdad	Lowland (10-14np)	3,000	2,300	1,600	green needlegrass	25
					cottonwood	10
					needleandthread	10
					slender wheatgrass	10
					western wheatgrass	10
					Sandberg bluegrass	5
					snowberry	5
Clarkelen	Lowland (10-14np)	3,000	2,300	1,600	green needlegrass	25
					cottonwood	10
					needleandthread	10
					slender wheatgrass	10
					western wheatgrass	10
					Sandberg bluegrass	5
					snowberry	5
153:						
Haverdad	Lowland (10-14np)	3,000	2,300	1,600	green needlegrass	25
					cottonwood	10
					needleandthread	10
					slender wheatgrass	10
					western wheatgrass	10
					Sandberg bluegrass	5
					snowberry	5
Kishona	Loamy (10-14np)	1,500	1,200	700	needleandthread	25
					western wheatgrass	25
					blue grama	15
					green needlegrass	15
					big sagebrush	10
					Cusick's bluegrass	5
154:						
Heldt	Clayey (10-14np)	1,400	1,000	600	green needlegrass	40
					western wheatgrass	40
					big sagebrush	10
					blue grama	10
					skyline bluegrass	10

Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production: Favorable year	Normal year	Unfavorable year	Characteristic vegetation	Rangeland composition
		Lb/acre	Lb/acre	Lb/acre		Pct
155:						
Heldt, saline	Saline Upland (10-14np)	650	500	250	gardner saltbush	50
					inland saltgrass	15
					Indian ricegrass	10
					alkali sacaton	10
					bottlebrush squirreltail	10
					greasewood	10
					western wheatgrass	10
Bidman, saline	Saline Lowland (10-14np)	2,200	1,700	1,400	alkali sacaton	25
					greasewood	20
					western wheatgrass	15
					Nuttall's alkaligrass	10
					bottlebrush squirreltail	10
					inland saltgrass	10
					Sandberg bluegrass	5
156:						
Hiland	Sandy (10-14np)	1,600	1,300	750	needleandthread	25
					prairie sandreed	20
					Indian ricegrass	10
					little bluestem	10
					western wheatgrass	10
					blue grama	5
					silver sagebrush	5
					threadleaf sedge	5
157:						
Hiland	Sandy (10-14np)	1,600	1,300	750	needleandthread	25
					prairie sandreed	20
					Indian ricegrass	10
					little bluestem	10
					western wheatgrass	10
					blue grama	5
					silver sagebrush	5
					threadleaf sedge	5
Bowbac	Sandy (10-14np)	1,600	1,300	750	needleandthread	25
					prairie sandreed	20
					Indian ricegrass	10
					little bluestem	10
					western wheatgrass	10
					blue grama	5
					silver sagebrush	5
					threadleaf sedge	5
158:						
Hiland	Sandy (10-14np)	1,600	1,300	750	needleandthread	25
					prairie sandreed	20
					Indian ricegrass	10
					little bluestem	10
					western wheatgrass	10
					blue grama	5
					silver sagebrush	5
					threadleaf sedge	5

Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production: Favorable year	Normal year	Unfavorable year	Characteristic vegetation	Rangeland composition
		Lb/acre	Lb/acre	Lb/acre		Pct
158: (cont.)						
Bowbac	Sandy (10-14np)	1,600	1,300	750	needleandthread	25
					prairie sandreed	20
					Indian ricegrass	10
					little bluestem	10
					western wheatgrass	10
					blue grama	5
					silver sagebrush	5
					threadleaf sedge	5
159:						
Hiland	Sandy (10-14np)	1,600	1,300	750	needleandthread	25
					prairie sandreed	20
					Indian ricegrass	10
					little bluestem	10
					western wheatgrass	10
					blue grama	5
					silver sagebrush	5
					threadleaf sedge	5
Vonalee	Sandy (10-14np)	1,600	1,300	750	needleandthread	25
					prairie sandreed	20
					Indian ricegrass	10
					little bluestem	10
					western wheatgrass	10
					blue grama	5
					silver sagebrush	5
					threadleaf sedge	5
160:						
Hiland	Sandy (10-14np)	1,600	1,300	750	needleandthread	25
					prairie sandreed	20
					Indian ricegrass	10
					little bluestem	10
					western wheatgrass	10
					blue grama	5
					silver sagebrush	5
					threadleaf sedge	5
Vonalee	Sandy (10-14np)	1,600	1,300	750	needleandthread	25
					prairie sandreed	20
					Indian ricegrass	10
					little bluestem	10
					western wheatgrass	10
					blue grama	5
					silver sagebrush	5
					threadleaf sedge	5
161:						
Hilight	Shallow Clayey (10-14np)	1,000	750	450	green needlegrass	40
					western wheatgrass	40
					bluebunch wheatgrass	15
					big sagebrush	5
					blue grama	5

Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production: Favorable year	Normal year	Unfavorable year	Characteristic vegetation	Rangeland composition
		Lb/acre	Lb/acre	Lb/acre		Pct
161: (cont.)						
Taluce, cool	Shallow Sandy (10-14np)	1,300	1,000	600	needleandthread	25
					prairie sandreed	20
					bluebunch wheatgrass	10
					little bluestem	10
					blue grama	5
					ponderosa pine	5
					threadleaf sedge	5
Wags	Dense Clay (10-14np)	1,000	750	450	western wheatgrass	50
					green needlegrass	30
					Sandberg bluegrass	5
					big sagebrush	5
					birdfoot sagebrush	5
162:						
Lismas	Shallow Clayey (10-14np)	1,000	750	450	green needlegrass	40
					western wheatgrass	40
					bluebunch wheatgrass	15
					big sagebrush	5
					blue grama	5
Mittenbutte, cool	Shallow Sandy (10-14np)	1,300	1,000	600	needleandthread	25
					prairie sandreed	20
					bluebunch wheatgrass	10
					little bluestem	10
					blue grama	5
					threadleaf sedge	5
Sabatka	Dense Clay (15-17np)	1,000	750	450	western wheatgrass	50
					green needlegrass	30
					Sandberg bluegrass	5
					big sagebrush	5
					birdfoot sagebrush	5
163:						
Hilight	Shallow Clayey (10-14np)	1,000	750	450	green needlegrass	40
					western wheatgrass	40
					bluebunch wheatgrass	15
					big sagebrush	5
					blue grama	5
Wags	Dense Clay (10-14np)	1,000	750	450	western wheatgrass	50
					green needlegrass	30
					Sandberg bluegrass	5
					big sagebrush	5
					birdfoot sagebrush	5
Badland	---	---	---	---	---	---
164:						
Lismas	Shallow Clayey (10-14np)	1,000	750	450	green needlegrass	40
					western wheatgrass	40
					bluebunch wheatgrass	15
					big sagebrush	5
					blue grama	5

Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production: Favorable year	Normal year	Unfavorable year	Characteristic vegetation	Rangeland composition
		Lb/acre	Lb/acre	Lb/acre		Pct
164: (cont.)						
Sabatka	Dense Clay (10-14np)	1,000	750	450	western wheatgrass	50
					green needlegrass	30
					Sandberg bluegrass	5
					big sagebrush	5
					birdfoot sagebrush	5
Badland	---	---	---	---	---	---
165:						
Jayem	Sandy (15-17np)	2,400	2,000	1,600	needleandthread	25
					prairie sandreed	25
					Indian ricegrass	10
					little bluestem	10
					silver sagebrush	5
					threadleaf sedge	5
					western wheatgrass	5
166:						
Jaywest	Loamy (15-17np)	2,300	1,900	1,500	green needlegrass	25
					western wheatgrass	25
					needleandthread	20
					big bluestem	10
					big sagebrush	10
					blue grama	10
					Sandberg bluegrass	5
167:						
Jaywest	Loamy (15-17np)	2,300	1,900	1,500	green needlegrass	25
					western wheatgrass	25
					needleandthread	20
					big bluestem	10
					big sagebrush	10
					blue grama	10
					Sandberg bluegrass	5
Moorhead	Loamy (15-17np)	2,300	1,900	1,500	green needlegrass	25
					western wheatgrass	25
					needleandthread	20
					big bluestem	10
					big sagebrush	10
					blue grama	10
					Sandberg bluegrass	5
168:						
Jaywest	Loamy (15-17np)	2,300	1,900	1,500	green needlegrass	25
					western wheatgrass	25
					needleandthread	20
					big bluestem	10
					big sagebrush	10
					blue grama	10
					Sandberg bluegrass	5
Spottedhorse	Loamy (15-17np)	2,300	1,900	1,500	green needlegrass	25
					western wheatgrass	25
					needleandthread	20
					big bluestem	10
					big sagebrush	10
					blue grama	10
					Sandberg bluegrass	5

Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production: Favorable year	Normal year	Unfavorable year	Characteristic vegetation	Rangeland composition
		Lb/acre	Lb/acre	Lb/acre		Pct
169:						
Julesburg	Sandy (15-17np)	2,400	2,000	1,600	needleandthread	25
					prairie sandreed	25
					Indian ricegrass	10
					little bluestem	10
					silver sagebrush	5
					threadleaf sedge	5
					western wheatgrass	5
170:						
Keeline	Sandy (10-14np)	1,600	1,300	750	needleandthread	25
					prairie sandreed	20
					Indian ricegrass	10
					little bluestem	10
					western wheatgrass	10
					blue grama	5
					silver sagebrush	5
					threadleaf sedge	5
Tullock	Sands (10-14np)	1,700	1,400	900	prairie sandreed	50
					sand bluestem	25
					needleandthread	15
					Indian ricegrass	10
					silver sagebrush	5
					threadleaf sedge	5
171:						
Keeline	Sandy (10-14np)	1,600	1,300	750	needleandthread	25
					prairie sandreed	20
					Indian ricegrass	10
					little bluestem	10
					western wheatgrass	10
					blue grama	5
					silver sagebrush	5
					threadleaf sedge	5
Tullock	Sands (10-14np)	1,700	1,400	900	prairie sandreed	50
					sand bluestem	25
					needleandthread	15
					Indian ricegrass	10
					silver sagebrush	5
					threadleaf sedge	5
Niobrara, dry	Shallow Sandy (10-14np)	1,300	1,000	600	needleandthread	25
					prairie sandreed	20
					bluebunch wheatgrass	10
					little bluestem	10
					blue grama	5
					threadleaf sedge	5
172:						
Keyner	Loamy (10-14np)	1,500	1,200	700	needleandthread	25
					western wheatgrass	25
					blue grama	15
					green needlegrass	15
					big sagebrush	10
					Cusick's bluegrass	5

Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production: Favorable year	Normal year	Unfavorable year	Characteristic vegetation	Rangeland composition
		Lb/acre	Lb/acre	Lb/acre		Pct
173:						
Lawver	Loamy (10-14np)	1,500	1,200	700	needleandthread	25
					western wheatgrass	25
					blue grama	15
					green needlegrass	15
					big sagebrush	10
					Cusick's bluegrass	5
Teckla	Loamy (10-14np)	1,500	1,200	700	needleandthread	25
					western wheatgrass	25
					blue grama	15
					green needlegrass	15
					big sagebrush	10
					Cusick's bluegrass	5
Wibaux	Shallow Loamy (10-14np)	1,200	900	450	bluebunch wheatgrass	50
					western wheatgrass	15
					blue grama	10
					little bluestem	10
					needleandthread	10
					threadleaf sedge	10
					big sagebrush	5
					green needlegrass	5
174:						
Brislawn	Loamy (15-17np)	2,300	1,900	1,500	green needlegrass	25
					western wheatgrass	25
					needleandthread	20
					big bluestem	10
					big sagebrush	10
					blue grama	10
					Sandberg bluegrass	5
Rockybutte	Loamy (15-17np)	2,300	1,900	1,500	green needlegrass	25
					western wheatgrass	25
					needleandthread	20
					big bluestem	10
					big sagebrush	10
					blue grama	10
					Sandberg bluegrass	5
Ironbutte	Shallow Loamy (15-17np)	1,600	1,300	1,000	bluebunch wheatgrass	25
					western wheatgrass	25
					blue grama	10
					green needlegrass	10
					little bluestem	10
					needleandthread	10
					big sagebrush	5
175:						
Lawver	Loamy (10-14np)	1,500	1,200	700	needleandthread	25
					western wheatgrass	25
					blue grama	15
					green needlegrass	15
					big sagebrush	10
					Cusick's bluegrass	5

Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production: Favorable year	Normal year	Unfavorable year	Characteristic vegetation	Rangeland composition
		Lb/acre	Lb/acre	Lb/acre		Pct
175: (cont.)						
Wibaux	Shallow Loamy (10-14np)	1,200	900	450	bluebunch wheatgrass	50
					western wheatgrass	15
					blue grama	10
					little bluestem	10
					needleandthread	10
					threadleaf sedge	10
					big sagebrush	5
					green needlegrass	5
176:						
Leiter	Clayey (15-17np)	2,300	1,900	1,500	green needlegrass	40
					western wheatgrass	30
					big bluestem	10
					big sagebrush	10
					blue grama	5
					sideoats grama	5
Cromack	Clayey (15-17np)	2,300	1,900	1,500	green needlegrass	40
					western wheatgrass	30
					big bluestem	10
					big sagebrush	10
					blue grama	5
					sideoats grama	5
177:						
Maysdorf	Sandy (10-14np)	1,600	1,300	750	needleandthread	25
					prairie sandreed	20
					Indian ricegrass	10
					little bluestem	10
					western wheatgrass	10
					blue grama	5
					silver sagebrush	5
					threadleaf sedge	5
178:						
Maysdorf	Loamy (10-14np)	1,500	1,200	700	needleandthread	25
					western wheatgrass	25
					blue grama	15
					green needlegrass	15
					big sagebrush	10
					Cusick's bluegrass	5
179:						
Maysdorf	Sandy (10-14np)	1,600	1,300	750	needleandthread	25
					prairie sandreed	20
					Indian ricegrass	10
					little bluestem	10
					western wheatgrass	10
					blue grama	5
					silver sagebrush	5
					threadleaf sedge	5
Pugsley	Sandy (10-14np)	1,600	1,300	750	needleandthread	25
					prairie sandreed	20
					Indian ricegrass	10
					little bluestem	10
					western wheatgrass	10
					blue grama	5
					silver sagebrush	5
					threadleaf sedge	5

Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production: Favorable year	Normal year	Unfavorable year	Characteristic vegetation	Rangeland composition
		Lb/acre	Lb/acre	Lb/acre		Pct
180:						
Maysdorf	Sandy (10-14np)	1,600	1,300	750	needleandthread	25
					prairie sandreed	20
					Indian ricegrass	10
					little bluestem	10
					western wheatgrass	10
					blue grama	5
					silver sagebrush	5
					threadleaf sedge	5
Pugsley	Sandy (10-14np)	1,600	1,300	750	needleandthread	25
					prairie sandreed	20
					Indian ricegrass	10
					little bluestem	10
					western wheatgrass	10
					blue grama	5
					silver sagebrush	5
					threadleaf sedge	5
181:						
Moorhead	Clayey (15-17np)	2,300	1,900	1,500	green needlegrass	40
					western wheatgrass	30
					big bluestem	10
					big sagebrush	10
					blue grama	5
					sideoats grama	5
182:						
Moorhead	Loamy (15-17np)	2,300	1,900	1,500	green needlegrass	25
					western wheatgrass	25
					needleandthread	20
					big bluestem	10
					big sagebrush	10
					blue grama	10
					Sandberg bluegrass	5
183:						
Moorhead	Clayey (15-17np)	2,300	1,900	1,500	green needlegrass	40
					western wheatgrass	30
					big bluestem	10
					big sagebrush	10
					blue grama	5
					sideoats grama	5
Leiter	Clayey (15-17np)	2,300	1,900	1,500	green needlegrass	40
					western wheatgrass	30
					big bluestem	10
					big sagebrush	10
					blue grama	5
					sideoats grama	5
184:						
Moorhead	Clayey (15-17np)	2,300	1,900	1,500	green needlegrass	40
					western wheatgrass	30
					big bluestem	10
					big sagebrush	10
					blue grama	5
					sideoats grama	5

Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production: Favorable year	Normal year	Unfavorable year	Characteristic vegetation	Rangeland composition
		Lb/acre	Lb/acre	Lb/acre		Pct
184: (cont.)						
Leiter	Clayey (15-17np)	2,300	1,900	1,500	green needlegrass	40
					western wheatgrass	30
					big bluestem	10
					big sagebrush	10
					blue grama	5
					sideoats grama	5
185:						
Moskee	Sandy (15-17np)	2,400	2,000	1,600	needleandthread	25
					prairie sandreed	25
					Indian ricegrass	10
					little bluestem	10
					silver sagebrush	5
					threadleaf sedge	5
					western wheatgrass	5
186:						
Moskee	Sandy (15-17np)	2,400	2,000	1,600	needleandthread	25
					prairie sandreed	25
					Indian ricegrass	10
					little bluestem	10
					silver sagebrush	5
					threadleaf sedge	5
					western wheatgrass	5
187:						
Nuncho	Loamy (15-17np)	2,300	1,900	1,500	green needlegrass	25
					western wheatgrass	25
					needleandthread	20
					big bluestem	10
					big sagebrush	10
					blue grama	10
					Sandberg bluegrass	5
188:						
Orpha	Sands (10-14np)	1,700	1,400	900	prairie sandreed	50
					sand bluestem	25
					needleandthread	15
					Indian ricegrass	10
					silver sagebrush	5
					threadleaf sedge	5
Tullock	Sands (10-14np)	1,700	1,400	900	prairie sandreed	50
					sand bluestem	25
					needleandthread	15
					Indian ricegrass	10
					silver sagebrush	5
					threadleaf sedge	5
189:						
Oshoto	Loamy (15-17np)	2,300	1,900	1,500	green needlegrass	25
					western wheatgrass	25
					needleandthread	20
					big bluestem	10
					big sagebrush	10
					blue grama	10
					Sandberg bluegrass	5

Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production: Favorable year	Normal year	Unfavorable year	Characteristic vegetation	Rangeland composition
		Lb/acre	Lb/acre	Lb/acre		Pct
189: (cont.)						
Moorhead	Loamy (15-17np)	2,300	1,900	1,500	green needlegrass	25
					western wheatgrass	25
					needleandthread	20
					big bluestem	10
					big sagebrush	10
					blue grama	10
					Sandberg bluegrass	5
190:						
Parmleed	Loamy (10-14np)	1,500	1,200	700	needleandthread	25
					western wheatgrass	25
					blue grama	15
					green needlegrass	15
					big sagebrush	10
					Cusick's bluegrass	5
Renohill	Clayey (10-14np)	1,400	1,000	600	green needlegrass	35
					western wheatgrass	35
					blue grama	10
					Cusick's bluegrass	5
					big sagebrush	5
191:						
Pits	---	---	---	---	---	---
Dumps	---	---	---	---	---	---
192:						
Platmak	Loamy (15-17np)	2,300	1,900	1,500	green needlegrass	25
					western wheatgrass	25
					needleandthread	20
					big bluestem	10
					big sagebrush	10
					blue grama	10
					Sandberg bluegrass	5
193:						
Pugsley	Sandy (10-14np)	1,600	1,300	750	needleandthread	25
					prairie sandreed	20
					Indian ricegrass	10
					little bluestem	10
					western wheatgrass	10
					blue grama	5
					silver sagebrush	5
					threadleaf sedge	5
Decolney	Sandy (10-14np)	1,600	1,300	750	needleandthread	25
					prairie sandreed	20
					Indian ricegrass	10
					little bluestem	10
					western wheatgrass	10
					blue grama	5
					silver sagebrush	5
					threadleaf sedge	5

Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production: Favorable year	Normal year	Unfavorable year	Characteristic vegetation	Rangeland composition
		Lb/acre	Lb/acre	Lb/acre		Pct
194:						
Pugsley	Sandy (10-14np)	1,600	1,300	750	needleandthread	25
					prairie sandreed	20
					Indian ricegrass	10
					little bluestem	10
					western wheatgrass	10
					blue grama	5
					silver sagebrush	5
					threadleaf sedge	5
Decolney	Sandy (10-14np)	1,600	1,300	750	needleandthread	25
					prairie sandreed	20
					Indian ricegrass	10
					little bluestem	10
					western wheatgrass	10
					blue grama	5
					silver sagebrush	5
					threadleaf sedge	5
195:						
Rauzi	Sandy (15-17np)	2,400	2,000	1,600	needleandthread	25
					prairie sandreed	25
					Indian ricegrass	10
					little bluestem	10
					silver sagebrush	5
					threadleaf sedge	5
					western wheatgrass	5
196:						
Rauzi	Loamy (15-17np)	2,300	1,900	1,500	green needlegrass	25
					western wheatgrass	25
					needleandthread	20
					big bluestem	10
					big sagebrush	10
					blue grama	10
					Sandberg bluegrass	5
197:						
Rauzi	Sandy (15-17np)	2,400	2,000	1,600	needleandthread	25
					prairie sandreed	25
					Indian ricegrass	10
					little bluestem	10
					silver sagebrush	5
					threadleaf sedge	5
					western wheatgrass	5
Elwop	Sandy (15-17np)	2,400	2,000	1,600	needleandthread	25
					prairie sandreed	25
					Indian ricegrass	10
					little bluestem	10
					silver sagebrush	5
					threadleaf sedge	5
					western wheatgrass	5

Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production: Favorable year	Normal year	Unfavorable year	Characteristic vegetation	Rangeland composition
		Lb/acre	Lb/acre	Lb/acre		Pct
198:						
Recluse	Loamy (15-17np)	2,300	1,900	1,500	green needlegrass	25
					western wheatgrass	25
					needleandthread	20
					big bluestem	10
					big sagebrush	10
					blue grama	10
					Sandberg bluegrass	5
199:						
Renohill	Clayey (10-14np)	1,400	1,000	600	green needlegrass	40
					western wheatgrass	40
					big sagebrush	10
					blue grama	10
					skyline bluegrass	10
Savageton	Clayey (10-14np)	1,400	1,000	600	green needlegrass	40
					western wheatgrass	40
					big sagebrush	10
					blue grama	10
					skyline bluegrass	10
200:						
Renohill	Clayey (10-14np)	1,400	1,000	600	green needlegrass	40
					western wheatgrass	40
					big sagebrush	10
					blue grama	10
					skyline bluegrass	10
Savageton	Clayey (10-14np)	1,400	1,000	600	green needlegrass	40
					western wheatgrass	40
					big sagebrush	10
					blue grama	10
					skyline bluegrass	10
201:						
Renohill	Clayey (10-14np)	1,400	1,000	600	green needlegrass	40
					western wheatgrass	40
					big sagebrush	10
					blue grama	10
					skyline bluegrass	10
Shingle	Shallow Loamy (10-14np)	1,200	900	450	western wheatgrass	25
					bluebunch wheatgrass	15
					blue grama	10
					little bluestem	10
					needleandthread	10
					threadleaf sedge	10
					big sagebrush	5
					green needlegrass	5
Worf	Shallow Loamy (10-14np)	1,200	900	450	bluebunch wheatgrass	15
					western wheatgrass	15
					blue grama	10
					little bluestem	10
					needleandthread	10
					threadleaf sedge	10
					big sagebrush	5
					green needlegrass	5

Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production: Favorable year	Normal year	Unfavorable year	Characteristic vegetation	Rangeland composition
		Lb/acre	Lb/acre	Lb/acre		Pct
202:						
Renohill	Clayey (10-14np)	1,400	1,000	600	green needlegrass	40
					western wheatgrass	40
					big sagebrush	10
					blue grama	10
					skyline bluegrass	10
Worfka	Shallow Clayey (10-14np)	1,000	750	450	green needlegrass	40
					western wheatgrass	40
					bluebunch wheatgrass	15
					big sagebrush	5
					blue grama	5
203:						
Rockypoint	Lowland (15-17np)	3,500	3,000	2,500	green needlegrass	15
					bearded wheatgrass	10
					cottonwood	10
					slender wheatgrass	10
					western wheatgrass	10
					Sandberg bluegrass	5
					needleandthread	5
					silver sagebrush	5
Iwait	Loamy (15-17np)	2,300	1,900	1,500	green needlegrass	25
					western wheatgrass	25
					needleandthread	20
					big bluestem	10
					big sagebrush	10
					blue grama	10
					Sandberg bluegrass	5
204:						
Samday	Shallow Clayey (10-14np)	1,000	750	450	green needlegrass	40
					western wheatgrass	40
					bluebunch wheatgrass	15
					big sagebrush	5
					blue grama	5
Samday, cool	Very Shallow (10-14np)	500	350	250	bluebunch wheatgrass	50
					Cusick's bluegrass	10
					Rocky Mountain juniper	10
					little bluestem	10
					needleandthread	10
					western wheatgrass	10
Shingle	Shallow Loamy (10-14np)	1,200	900	450	western wheatgrass	25
					bluebunch wheatgrass	15
					blue grama	10
					little bluestem	10
					needleandthread	10
					threadleaf sedge	10
					big sagebrush	5
					green needlegrass	5
205:						
Samday	Shallow Clayey (10-14np)	1,000	750	450	green needlegrass	40
					western wheatgrass	40
					bluebunch wheatgrass	15
					big sagebrush	5
					blue grama	5

Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production: Favorable year	Normal year	Unfavorable year	Characteristic vegetation	Rangeland composition
		Lb/acre	Lb/acre	Lb/acre		Pct
205: (cont.)						
Savageton	Clayey (10-14np)	1,400	1,000	600	green needlegrass	40
					western wheatgrass	40
					Cusick's bluegrass	10
					big sagebrush	10
					blue grama	10
206:						
Samday	Shallow Clayey (10-14np)	1,000	750	450	green needlegrass	40
					western wheatgrass	40
					bluebunch wheatgrass	15
					big sagebrush	5
					blue grama	5
Shingle	Shallow Loamy (10-14np)	1,200	900	450	bluebunch wheatgrass	50
					western wheatgrass	15
					blue grama	10
					little bluestem	10
					needleandthread	10
					threadleaf sedge	10
					big sagebrush	5
					green needlegrass	5
Badland	---	---	---	---	---	---
207:						
Cromack	Clayey (15-17np)	2,300	1,900	1,500	green needlegrass	40
					western wheatgrass	30
					big sagebrush	15
					big bluestem	10
					blue grama	5
					sideoats grama	5
Fairburn	Shallow Loamy (15-17np)	1,600	1,300	1,000	bluebunch wheatgrass	25
					western wheatgrass	20
					green needlegrass	10
					needleandthread	10
					big sagebrush	5
					blue grama	5
					little bluestem	5
Ucross	Loamy (15-17np)	2,300	1,900	1,500	green needlegrass	25
					western wheatgrass	25
					needleandthread	20
					big bluestem	10
					big sagebrush	10
					blue grama	10
					Sandberg bluegrass	5
208:						
Savageton	Clayey (10-14np)	1,400	1,000	600	green needlegrass	40
					western wheatgrass	40
					Cusick's bluegrass	10
					big sagebrush	10
					blue grama	10
Silhouette	Clayey (10-14np)	1,400	1,000	600	green needlegrass	40
					western wheatgrass	40
					Cusick's bluegrass	10
					big sagebrush	10
					blue grama	10

Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production: Favorable year	Normal year	Unfavorable year	Characteristic vegetation	Rangeland composition
		Lb/acre	Lb/acre	Lb/acre		Pct
209:						
Savageton	Clayey (10-14np)	1,400	1,000	600	green needlegrass	40
					western wheatgrass	40
					Cusick's bluegrass	10
					big sagebrush	10
					blue grama	10
Silhouette	Clayey (10-14np)	1,400	1,000	600	green needlegrass	40
					western wheatgrass	40
					Cusick's bluegrass	10
					big sagebrush	10
					blue grama	10
210:						
Shingle	Shallow Loamy (10-14np)	1,200	900	450	bluebunch wheatgrass	50
					western wheatgrass	15
					blue grama	10
					little bluestem	10
					needleandthread	10
					threadleaf sedge	10
					big sagebrush	5
					green needlegrass	5
Taluce	Shallow Sandy (10-14np)	1,300	1,000	600	needleandthread	25
					prairie sandreed	20
					bluebunch wheatgrass	10
					little bluestem	10
					blue grama	5
					threadleaf sedge	5
211:						
Shingle	Shallow Loamy (10-14np)	1,200	900	450	bluebunch wheatgrass	50
					western wheatgrass	15
					blue grama	10
					little bluestem	10
					needleandthread	10
					threadleaf sedge	10
					big sagebrush	5
					green needlegrass	5
Worf	Shallow Loamy (10-14np)	1,200	900	450	bluebunch wheatgrass	50
					western wheatgrass	15
					blue grama	10
					little bluestem	10
					needleandthread	10
					threadleaf sedge	10
					big sagebrush	5
					green needlegrass	5
212:						
Teckla	Loamy (10-14np)	1,500	1,200	700	needleandthread	25
					western wheatgrass	25
					blue grama	15
					green needlegrass	15
					big sagebrush	10
					Cusick's bluegrass	5

Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production: Favorable year	Normal year	Unfavorable year	Characteristic vegetation	Rangeland composition
		Lb/acre	Lb/acre	Lb/acre		Pct
213:						
Terro	Sandy (10-14np)	1,600	1,300	750	needleandthread	25
					prairie sandreed	20
					Indian ricegrass	10
					little bluestem	10
					western wheatgrass	10
					blue grama	5
					silver sagebrush	5
					threadleaf sedge	5
Taluce	Shallow Sandy (10-14np)	1,300	1,000	600	needleandthread	25
					prairie sandreed	20
					bluebunch wheatgrass	10
					little bluestem	10
					blue grama	5
					threadleaf sedge	5
214:						
Theedle	Loamy (10-14np)	1,500	1,200	700	needleandthread	25
					western wheatgrass	25
					blue grama	15
					green needlegrass	15
					big sagebrush	10
					Cusick's bluegrass	5
Kishona	Loamy (10-14np)	1,500	1,200	700	needleandthread	25
					western wheatgrass	25
					blue grama	15
					green needlegrass	15
					big sagebrush	10
					Cusick's bluegrass	5
215:						
Theedle	Loamy (10-14np)	1,500	1,200	700	needleandthread	25
					western wheatgrass	25
					blue grama	15
					green needlegrass	15
					big sagebrush	10
					Cusick's bluegrass	5
Kishona	Loamy (10-14np)	1,500	1,200	700	needleandthread	25
					western wheatgrass	25
					blue grama	15
					green needlegrass	15
					big sagebrush	10
					Cusick's bluegrass	5
216:						
Theedle	Loamy (10-14np)	1,500	1,200	700	needleandthread	25
					western wheatgrass	25
					blue grama	15
					green needlegrass	15
					big sagebrush	10
					Cusick's bluegrass	5
Kishona	Loamy (10-14np)	1,500	1,200	700	needleandthread	25
					western wheatgrass	25
					blue grama	15
					green needlegrass	15
					big sagebrush	10
					Cusick's bluegrass	5

Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production: Favorable year	Normal year	Unfavorable year	Characteristic vegetation	Rangeland composition
		Lb/acre	Lb/acre	Lb/acre		Pct
216: (cont.)						
Shingle	Shallow Loamy (10-14np)	1,200	900	450	bluebunch wheatgrass	50
					western wheatgrass	15
					blue grama	10
					little bluestem	10
					needleandthread	10
					threadleaf sedge	10
					big sagebrush	5
					green needlegrass	5
217:						
Theedle	Loamy (10-14np)	1,500	1,200	700	needleandthread	25
					western wheatgrass	25
					blue grama	15
					green needlegrass	15
					big sagebrush	10
					Cusick's bluegrass	5
Shingle	Shallow Loamy (10-14np)	1,200	900	450	bluebunch wheatgrass	50
					western wheatgrass	15
					blue grama	10
					little bluestem	10
					needleandthread	10
					threadleaf sedge	10
					big sagebrush	5
					green needlegrass	5
218:						
Theedle	Loamy (10-14np)	1,500	1,200	700	needleandthread	25
					western wheatgrass	25
					blue grama	15
					green needlegrass	15
					big sagebrush	10
					Cusick's bluegrass	5
Turnercrest	Sandy (10-14np)	1,600	1,300	750	needleandthread	25
					prairie sandreed	20
					Indian ricegrass	10
					little bluestem	10
					western wheatgrass	10
					blue grama	5
					silver sagebrush	5
					threadleaf sedge	5
Kishona	Loamy (10-14np)	1,500	1,200	700	needleandthread	25
					western wheatgrass	25
					blue grama	15
					green needlegrass	15
					big sagebrush	10
					Cusick's bluegrass	5
219:						
Torriarents	---	---	---	---	---	---
Torriorthents	---	---	---	---	---	---

Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production: Favorable year	Normal year	Unfavorable year	Characteristic vegetation	Rangeland composition
		Lb/acre	Lb/acre	Lb/acre		Pct
220:						
Pitchdraw	Sandy (15-17np)	2,400	2,000	1,600	needleandthread	25
					prairie sandreed	25
					Indian ricegrass	10
					little bluestem	10
					silver sagebrush	5
					threadleaf sedge	5
					western wheatgrass	5
Ashollow	Sandy (15-17np)	2,400	2,000	1,600	needleandthread	25
					prairie sandreed	25
					Indian ricegrass	10
					little bluestem	10
					silver sagebrush	5
					threadleaf sedge	5
					western wheatgrass	5
Niobrara	Shallow Sandy (15-17np)	1,600	1,300	1,000	needleandthread	25
					prairie sandreed	20
					bluebunch wheatgrass	10
					little bluestem	10
					Indian ricegrass	5
					western wheatgrass	5
221:						
Turnercrest	Sandy (10-14np)	1,600	1,300	750	needleandthread	25
					prairie sandreed	20
					little bluestem	10
					western wheatgrass	10
					silver sagebrush	5
					threadleaf sedge	5
Keeline	Sandy (10-14np)	1,600	1,300	750	needleandthread	25
					prairie sandreed	20
					little bluestem	10
					western wheatgrass	10
					silver sagebrush	5
					threadleaf sedge	5
Taluce	Shallow Sandy (10-14np)	1,300	1,000	600	needleandthread	25
					prairie sandreed	25
					bluebunch wheatgrass	10
					little bluestem	10
					blue grama	5
					threadleaf sedge	5
222:						
Turnercrest	Sandy (10-14np)	1,600	1,300	750	needleandthread	25
					prairie sandreed	20
					Indian ricegrass	10
					little bluestem	10
					western wheatgrass	10
					blue grama	5
					silver sagebrush	5
					threadleaf sedge	5

Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production: Favorable year	Normal year	Unfavorable year	Characteristic vegetation	Rangeland composition
		Lb/acre	Lb/acre	Lb/acre		Pct
222:(cont.)						
Wibaux, thin solum	Very Shallow (10-14np)	500	350	250	bluebunch wheatgrass	50
					Cusick's bluegrass	10
					little bluestem	10
					needleandthread	10
					western wheatgrass	10
					ponderosa pine	5
					skunkbush sumac	5
Taluce	Shallow Sandy (10-14np)	1,300	1,000	600	needleandthread	25
					prairie sandreed	20
					bluebunch wheatgrass	10
					little bluestem	10
					blue grama	5
					threadleaf sedge	5
223:						
Ucross	Loamy (15-17np)	2,300	1,900	1,500	green needlegrass	25
					western wheatgrass	25
					needleandthread	20
					big bluestem	10
					big sagebrush	10
					blue grama	10
					Sandberg bluegrass	5
224:						
Ucross	Loamy (15-17np)	2,300	1,900	1,500	green needlegrass	25
					western wheatgrass	25
					needleandthread	20
					big bluestem	10
					big sagebrush	10
					blue grama	10
					Sandberg bluegrass	5
Iwait	Loamy (15-17np)	2,300	1,900	1,500	green needlegrass	25
					western wheatgrass	25
					needleandthread	20
					big bluestem	10
					big sagebrush	10
					blue grama	10
					Sandberg bluegrass	5
225:						
Ucross	Loamy (15-17np)	2,300	1,900	1,500	green needlegrass	25
					western wheatgrass	25
					needleandthread	20
					big bluestem	10
					big sagebrush	10
					blue grama	10
					Sandberg bluegrass	5
Iwait	Loamy (15-17np)	2,300	1,900	1,500	green needlegrass	25
					western wheatgrass	25
					needleandthread	20
					big bluestem	10
					big sagebrush	10
					blue grama	10
					Sandberg bluegrass	5

Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production: Favorable year	Total dry-weight production: Normal year	Total dry-weight production: Unfavorable year	Characteristic vegetation	Rangeland composition
		Lb/acre	Lb/acre	Lb/acre		Pct
225: (cont.)						
Fairburn	Shallow Loamy (15-17np)	1,600	1,300	1,000	bluebunch wheatgrass	25
					western wheatgrass	20
					green needlegrass	10
					needleandthread	10
					big sagebrush	5
					blue grama	5
					little bluestem	5
226:						
Ulm	Loamy (10-14np)	1,500	1,200	700	needleandthread	25
					western wheatgrass	25
					blue grama	15
					green needlegrass	15
					big sagebrush	10
					Cusick's bluegrass	5
227:						
Ulm	Clayey (10-14np)	1,400	1,000	600	green needlegrass	40
					western wheatgrass	40
					big sagebrush	10
					blue grama	10
					skyline bluegrass	10
228:						
Ulm	Clayey (10-14np)	1,400	1,000	600	green needlegrass	40
					western wheatgrass	40
					Cusick's bluegrass	10
					big sagebrush	10
					blue grama	10
Renohill	Clayey (10-14np)	1,400	1,000	600	green needlegrass	40
					western wheatgrass	40
					Cusick's bluegrass	10
					big sagebrush	10
					blue grama	10
229:						
Ulm	Clayey (10-14np)	1,400	1,000	600	green needlegrass	40
					western wheatgrass	40
					Cusick's bluegrass	10
					big sagebrush	10
					blue grama	10
Renohill	Clayey (10-14np)	1,400	1,000	600	green needlegrass	40
					western wheatgrass	40
					Cusick's bluegrass	10
					big sagebrush	10
					blue grama	10
230:						
Urban land	---	---	---	---	---	---
Deekay	---	---	---	---	---	---
Moorhead	---	---	---	---	---	---
231:						
Urban land	---	---	---	---	---	---
Leiter	---	---	---	---	---	---

Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production: Favorable year	Normal year	Unfavorable year	Characteristic vegetation	Rangeland composition
		Lb/acre	Lb/acre	Lb/acre		Pct
231: (cont.)						
Moorhead	---	---	---	---	---	---
232:						
Urban land	---	---	---	---	---	---
Pitchdraw	---	---	---	---	---	---
Ashollow	---	---	---	---	---	---
233:						
Ustic Torriorthents	---	---	---	---	---	---
234:						
Ustic Torriorthents	---	---	---	---	---	---
Badland	---	---	---	---	---	---
235:						
Vonalee	Sandy (10-14np)	1,600	1,300	750	needleandthread	25
					prairie sandreed	20
					Indian ricegrass	10
					little bluestem	10
					western wheatgrass	10
					blue grama	5
					silver sagebrush	5
					threadleaf sedge	5
236:						
Vonalee	Sandy (10-14np)	1,600	1,300	750	needleandthread	25
					prairie sandreed	20
					Indian ricegrass	10
					little bluestem	10
					western wheatgrass	10
					blue grama	5
					silver sagebrush	5
					threadleaf sedge	5
Terro	Sandy (10-14np)	1,600	1,300	750	needleandthread	25
					prairie sandreed	20
					Indian ricegrass	10
					little bluestem	10
					western wheatgrass	10
					blue grama	5
					silver sagebrush	5
					threadleaf sedge	5
237:						
Vonalf	Sandy (15-17np)	2,400	2,000	1,600	needleandthread	25
					prairie sandreed	25
					Indian ricegrass	10
					little bluestem	10
					silver sagebrush	5
					threadleaf sedge	5
					western wheatgrass	5

Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production: Favorable year	Normal year	Unfavorable year	Characteristic vegetation	Rangeland composition
		Lb/acre	Lb/acre	Lb/acre		Pct
238:						
Vonalf	Sandy (15-17np)	2,400	2,000	1,600	needleandthread	25
					prairie sandreed	25
					Indian ricegrass	10
					little bluestem	10
					silver sagebrush	5
					threadleaf sedge	5
					western wheatgrass	5
Xema	Sandy (15-17np)	2,400	2,000	1,600	needleandthread	25
					prairie sandreed	25
					Indian ricegrass	10
					little bluestem	10
					silver sagebrush	5
					threadleaf sedge	5
					western wheatgrass	5
239:						
Ironbutte	Shallow Loamy (15-17np)	1,600	1,300	1,000	bluebunch wheatgrass	25
					western wheatgrass	25
					blue grama	10
					green needlegrass	10
					little bluestem	10
					needleandthread	10
					big sagebrush	5
Fairburn	Shallow Loamy (15-17np)	1,600	1,300	1,000	bluebunch wheatgrass	25
					western wheatgrass	20
					green needlegrass	10
					needleandthread	10
					blue grama	5
					little bluestem	5
Mittenbutte	Shallow Sandy (15-17np)	1,600	1,300	1,000	needleandthread	25
					prairie sandreed	20
					bluebunch wheatgrass	10
					little bluestem	10
					Indian ricegrass	5
					western wheatgrass	5
240:						
Wibaux	Shallow Loamy (10-14np)	1,200	900	450	bluebunch wheatgrass	50
					western wheatgrass	15
					blue grama	10
					little bluestem	10
					needleandthread	10
					threadleaf sedge	10
					big sagebrush	5
					green needlegrass	5
Wibaux, thin solum	Very Shallow (10-14np)	500	350	250	bluebunch wheatgrass	50
					Cusick's bluegrass	10
					little bluestem	10
					needleandthread	10
					western wheatgrass	10
					ponderosa pine	5
					skunkbush sumac	5

Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production: Favorable year	Normal year	Unfavorable year	Characteristic vegetation	Rangeland composition
		Lb/acre	Lb/acre	Lb/acre		Pct
241:						
Ironbutte	Shallow Loamy (15-17np)	1,600	1,300	1,000	bluebunch wheatgrass	25
					western wheatgrass	25
					blue grama	10
					green needlegrass	10
					little bluestem	10
					needleandthread	10
					big sagebrush	5
Ironbutte, thin solum	Very Shallow (15-17np)	500	350	250	bluebunch wheatgrass	25
					western wheatgrass	25
					blue grama	10
					green needlegrass	10
					little bluestem	10
					needleandthread	10
					big sagebrush	5
242:						
Ironbutte	Shallow Loamy (15-17np)	1,600	1,300	1,000	bluebunch wheatgrass	25
					western wheatgrass	25
					blue grama	10
					green needlegrass	10
					little bluestem	10
					needleandthread	10
					big sagebrush	5
Deekay	Loamy (15-17np)	2,300	1,900	1,500	green needlegrass	25
					western wheatgrass	25
					needleandthread	20
					big bluestem	10
					big sagebrush	10
					blue grama	10
					Sandberg bluegrass	5
Moorhead	Loamy (15-17np)	2,300	1,900	1,500	green needlegrass	25
					western wheatgrass	25
					needleandthread	20
					big bluestem	10
					big sagebrush	10
					blue grama	10
					Sandberg bluegrass	5
243:						
Wibaux, thick solum	Sandy (10-14np)	1,300	1,000	600	needleandthread	25
					prairie sandreed	25
					bluebunch wheatgrass	10
					little bluestem	10
					blue grama	5
					threadleaf sedge	5
Wibaux	Shallow Sandy (10-14np)	1,300	1,000	600	bluebunch wheatgrass	40
					western wheatgrass	15
					needleandthread	10
					big sagebrush	5
					blue grama	5
					green needlegrass	5
					little bluestem	5
					threadleaf sedge	5

Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production: Favorable year	Normal year	Unfavorable year	Characteristic vegetation	Rangeland composition
		Lb/acre	Lb/acre	Lb/acre		Pct
244:						
Muleherder	Loamy (15-17np)	1,600	1,300	1,000	green needlegrass	25
					western wheatgrass	25
					needleandthread	20
					big bluestem	10
					big sagebrush	10
					blue grama	10
					Sandberg bluegrass	5
Ironbutte	Shallow Loamy (15-17np)	1,600	1,300	1,000	bluebunch wheatgrass	25
					western wheatgrass	25
					blue grama	10
					green needlegrass	10
					little bluestem	10
					needleandthread	10
					big sagebrush	5
245:						
Wibaux	Shallow Loamy (10-14np)	1,200	900	450	bluebunch wheatgrass	40
					western wheatgrass	15
					needleandthread	10
					big sagebrush	5
					blue grama	5
					green needlegrass	5
					little bluestem	5
					threadleaf sedge	5
Shingle	Shallow Loamy (10-14np)	1,200	900	450	bluebunch wheatgrass	50
					western wheatgrass	15
					blue grama	10
					little bluestem	10
					needleandthread	10
					threadleaf sedge	10
					big sagebrush	5
					green needlegrass	5
Badland	---	---	---	---	---	---
246:						
Wyarno	Clayey (10-14np)	1,400	1,000	600	green needlegrass	40
					western wheatgrass	40
					Cusick's bluegrass	10
					big sagebrush	10
					blue grama	10
Ulm	Clayey (10-14np)	1,400	1,000	600	green needlegrass	40
					western wheatgrass	40
					Cusick's bluegrass	10
					big sagebrush	10
					blue grama	10
247:						
Wyotite	Loamy (10-14np)	1,500	1,200	700	needleandthread	25
					western wheatgrass	25
					green needlegrass	15
					blue grama	10
					Cusick's bluegrass	5
					big sagebrush	5

Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production: Favorable year	Total dry-weight production: Normal year	Total dry-weight production: Unfavorable year	Characteristic vegetation	Rangeland composition
		Lb/acre	Lb/acre	Lb/acre		Pct
247: (cont.)						
Ulm	Loamy (10-14np)	1,500	1,200	700	needleandthread	25
					western wheatgrass	25
					blue grama	15
					green needlegrass	15
					big sagebrush	10
					Cusick's bluegrass	5
248:						
Ziggy	Loamy (15-17np)	2,300	1,900	1,500	green needlegrass	25
					western wheatgrass	25
					needleandthread	20
					big bluestem	10
					big sagebrush	10
					blue grama	10
					Sandberg bluegrass	5
Iwait	Loamy (15-17np)	2,300	1,900	1,500	green needlegrass	25
					western wheatgrass	25
					needleandthread	20
					big bluestem	10
					big sagebrush	10
					blue grama	10
					Sandberg bluegrass	5
249:						
Ziggy	Loamy (15-17np)	2,300	1,900	1,500	green needlegrass	25
					western wheatgrass	25
					needleandthread	20
					big bluestem	10
					big sagebrush	10
					blue grama	10
					Sandberg bluegrass	5
Iwait	Loamy (15-17np)	2,300	1,900	1,500	green needlegrass	25
					western wheatgrass	25
					needleandthread	20
					big bluestem	10
					big sagebrush	10
					blue grama	10
					Sandberg bluegrass	5
250:						
Ziggy	Loamy (15-17np)	2,300	1,900	1,500	green needlegrass	25
					western wheatgrass	25
					needleandthread	20
					big bluestem	10
					big sagebrush	10
					blue grama	10
					Sandberg bluegrass	5
Ucross	Loamy (15-17np)	2,300	1,900	1,500	green needlegrass	25
					western wheatgrass	25
					needleandthread	20
					big bluestem	10
					big sagebrush	10
					blue grama	10
					Sandberg bluegrass	5

Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
250:(cont.)						
Oldwolf	Loamy (15-17np)	2,300	1,900	1,500	green needlegrass	25
					western wheatgrass	25
					needleandthread	20
					big bluestem	10
					big sagebrush	10
					blue grama	10
					Sandberg bluegrass	5

Wildlife Habitat

Soils affect the kind and amount of vegetation that is available to wildlife as food and cover. They also affect the construction of water impoundments. The kind and abundance of wildlife depend largely on the amount and distribution of food, cover, and water. Wildlife habitat can be created or improved by planting appropriate vegetation, by maintaining the existing plant cover, or by promoting the natural establishment of desirable plants.

In the table "Wildlife Habitat," the soils in the survey area are rated according to their potential for providing habitat for various kinds of wildlife. This information can be used in planning parks, wildlife refuges, nature study areas, and other developments for wildlife; in selecting soils that are suitable for establishing, improving, or maintaining specific elements of wildlife habitat; and in determining the intensity of management needed for each element of the habitat.

The potential of the soil is rated good, fair, poor, or very poor. A rating of good indicates that the element or kind of habitat is easily established, improved, or maintained. Few or no limitations affect management, and satisfactory results can be expected. A rating of fair indicates that the element or kind of habitat can be established, improved, or maintained in most places. Moderately intensive management is required for satisfactory results. A rating of poor indicates that limitations are severe for the designated element or kind of habitat. Habitat can be created, improved, or maintained in most places, but management is difficult and must be intensive. A rating of very poor indicates that restrictions for the element or kind of habitat are very severe and that unsatisfactory results can be expected. Creating, improving, or maintaining habitat is impractical or impossible.

The elements of wildlife habitat are described in the following paragraphs.

Grain and seed crops are domestic grains and seed-producing herbaceous plants. Soil properties and features that affect the growth of grain and seed crops are depth of the root zone, texture of the surface layer, available water capacity, wetness, slope, surface stoniness, and flooding. Soil temperature and soil moisture also are considerations. Examples of grain and seed crops are corn, wheat, oats, and barley.

Grasses and legumes are domestic perennial grasses and herbaceous legumes. Soil properties and features that affect the growth of grasses and legumes are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, flooding, and slope. Soil temperature and soil moisture also are considerations. Examples of grasses and legumes are fescue, wheatgrass, bromegrass, clover, and alfalfa.

Wild herbaceous plants are native or naturally established grasses and forbs, including weeds. Soil properties and features that affect the growth of these plants are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, and flooding. Soil temperature and soil moisture also are considerations. Examples of wild herbaceous plants are bluestem, wheatgrass, and grama.

Hardwood trees and woody understory produce nuts or other fruit, buds, catkins, twigs, bark, and foliage. Soil properties and features that affect the growth of hardwood trees and shrubs are depth of the root zone, available water capacity, and wetness. Examples of these plants are ash, poplar, and boxelder. Examples of fruit-producing shrubs that are suitable for planting on soils rated good are Russian-olive and crabapple.

Coniferous plants furnish browse and seeds. Soil properties and features that affect the growth of coniferous trees, shrubs, and ground cover are depth of the root zone, available water capacity, and wetness. Examples of coniferous plants are pine, cedar, and juniper.

Shrubs are bushy woody plants that produce fruit, buds, twigs, bark, and foliage. Soil properties and features that affect the growth of shrubs are depth of the root zone, available water capacity, salinity, and soil moisture. Examples of shrubs are

mountainmahogany, bitterbrush, snowberry, and big sagebrush.

Wetland plants are annual and perennial wild herbaceous plants that grow on moist or wet sites. Submerged or floating aquatic plants are excluded. Soil properties and features affecting wetland plants are texture of the surface layer, wetness, reaction, salinity, slope, and surface stoniness. Examples of wetland plants are rushes, sedges, and reeds.

Shallow water areas have an average depth of less than 5 feet. Some are naturally wet areas. Others are created by dams, levees, or other water-control structures. Soil properties and features affecting shallow water areas are depth to bedrock, wetness, surface stoniness, slope, and permeability. Examples of shallow water areas are marshes, waterfowl feeding areas, and ponds.

The habitat for various kinds of wildlife is described in the following paragraphs.

Habitat for openland wildlife consists of cropland, pasture, meadows, and areas that are overgrown with grasses, herbs, shrubs, and vines. These areas produce grain and seed crops, grasses and legumes, and wild herbaceous plants. Wildlife attracted to these areas include sage grouse, meadowlark, field sparrow, cottontail, and red fox.

Habitat for woodland wildlife consists of areas of deciduous and/or coniferous plants and associated grasses, legumes, and wild herbaceous plants. Wildlife attracted to these areas include wild turkey, porcupine, woodpeckers, squirrels, raccoon, and deer.

Habitat for wetland wildlife consists of open, marshy or swampy shallow water areas. Some of the wildlife attracted to such areas are ducks, geese, herons, shore birds, muskrat, and beaver.

Habitat for rangeland wildlife consists of areas of shrubs and wild herbaceous plants. Wildlife attracted to rangeland include antelope, deer, sage grouse, meadowlark, and lark bunting.

Wildlife Habitat

(Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "good," "fair," and "poor." Dashes (--) indicate the map unit component was not rated.) The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation.

Map symbol and soil name	Potential for habitat elements: Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Shrubs	Wetland plants	Shallow water areas	Potential as habitat for--: Openland wildlife	Woodland wildlife	Wetland wildlife	Rangeland wildlife
100:												
Aridic Ustorthents, saline	Poor	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
101:												
Arvada, thick surface	Poor	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
102:												
Arvada, thick surface	Poor	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
Arvada	Poor	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
Slickspots	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor
103:												
Arwite	Fair	Fair	Fair	Poor	Fair	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
104:												
Arwite	Fair	Fair	Fair	Poor	Fair	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
105:												
Arwite	Fair	Fair	Fair	Poor	Fair	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
Elwop	Fair	Fair	Fair	Poor	Fair	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
106:												
Arwite	Fair	Fair	Fair	Poor	Fair	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
Elwop	Fair	Fair	Fair	Poor	Fair	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
107:												
Arwite	Fair	Fair	Fair	Poor	Fair	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
Vonalf	Fair	Fair	Fair	Poor	Fair	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
108:												
Arwite	Fair	Fair	Fair	Poor	Fair	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
Vonalf	Fair	Fair	Fair	Poor	Fair	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair

Wildlife Habitat--Continued

Map symbol and soil name	Potential for habitat elements: Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Shrubs	Wetland plants	Shallow water areas	Potential as habitat for--: Openland wildlife	Woodland wildlife	Wetland wildlife	Rangeland wildlife
109:												
Bidman	Fair	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
110:												
Bidman, loamy substratum	Fair	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
111:												
Bidman	Fair	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
Parmleed	Fair	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
112:												
Bidman	Fair	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
Parmleed	Fair	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
113:												
Bidman	Fair	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
Ulm	Fair	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
114:												
Bowbac	Fair	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
Taluce	Poor	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
Badland	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor
115:												
Bowbac	Fair	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
Worf	Poor	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
116:												
Cambria	Fair	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
Kishona	Fair	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
Zigweid	Fair	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
117:												
Cambria	Fair	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair

Wildlife Habitat--Continued

Map symbol and soil name	Potential for habitat elements: Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Shrubs	Wetland plants	Shallow water areas	Potential as habitat for--: Openland wildlife	Woodland wildlife	Wetland wildlife	Rangeland wildlife
117: (cont.)												
Kishona---------------	Fair	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
Zigweid---------------	Fair	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
118:												
Clarkelen-------------	Fair	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
Draknab---------------	Fair	Fair	Fair	Very poor	Poor	Poor	Very poor	Very poor	Fair	Fair	Very poor	Fair
119:												
Clarkelen-------------	Fair	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
Embry-----------------	Poor	Fair	Fair	Very poor	Poor	Poor	Very poor	Very poor	Fair	Fair	Very poor	Fair
120:												
Clarkelen-------------	Fair	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
Keeline---------------	Fair	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
121:												
Cushman---------------	Fair	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
Cambria---------------	Fair	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
122:												
Cushman---------------	Fair	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
Cambria---------------	Fair	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
123:												
Cushman---------------	Fair	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
Renohill--------------	Fair	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
124:												
Cushman---------------	Fair	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
Shingle---------------	Poor	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
125:												
Cushman---------------	Fair	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair

Wildlife Habitat--Continued

Map symbol and soil name	Potential for habitat elements: Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Shrubs	Wetland plants	Shallow water areas	Potential as habitat for--: Openland wildlife	Woodland wildlife	Wetland wildlife	Rangeland wildlife
125: (cont.)												
Terro	Fair	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
126:												
Cushman	Fair	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
Theedle	Fair	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
127:												
Cushman	Fair	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
Theedle	Fair	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
128:												
Cushman	Fair	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
Worf	Poor	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
129:												
Decolney	Fair	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
Hiland	Fair	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
130:												
Decolney	Fair	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
Hiland	Fair	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
131:												
Deekay	Fair	Fair	Fair	Poor	Fair	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
132:												
Deekay	Fair	Fair	Fair	Poor	Fair	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
Moorhead	Fair	Fair	Fair	Poor	Fair	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
133:												
Deekay	Fair	Fair	Fair	Poor	Fair	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
Moorhead	Fair	Fair	Fair	Poor	Fair	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
134:												
Deekay	Fair	Fair	Fair	Poor	Fair	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair

Wildlife Habitat--Continued

Map symbol and soil name	Potential for habitat elements: Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Shrubs	Wetland plants	Shallow water areas	Potential as habitat for--: Openland wildlife	Woodland wildlife	Wetland wildlife	Rangeland wildlife
134: (cont.)												
Oldwolf	Fair	Fair	Fair	Poor	Fair	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
135:												
Deekay	Fair	Fair	Fair	Poor	Fair	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
Oldwolf	Fair	Fair	Fair	Poor	Fair	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
136:												
Deekay	Fair	Fair	Fair	Poor	Fair	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
Ziggy	Fair	Fair	Fair	Poor	Fair	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
137:												
Echeta	Fair	Fair	Fair	Poor	Fair	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
138:												
Echeta	Fair	Fair	Fair	Poor	Fair	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
Cromack	Fair	Fair	Fair	Poor	Fair	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
139:												
Embry	Poor	Fair	Fair	Very poor	Poor	Poor	Very poor	Very poor	Fair	Fair	Very poor	Fair
Orpha	Poor	Poor	Poor	Very poor	Poor	Poor	Very poor	Very poor	Poor	Poor	Very poor	Fair
140:												
Embry	Poor	Fair	Fair	Very poor	Poor	Poor	Very poor	Very poor	Fair	Fair	Very poor	Fair
Taluce	Poor	Fair	Fair	Very poor	Poor	Poor	Very poor	Very poor	Fair	Fair	Very poor	Fair
141:												
Emigha	Fair	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
142:												
Emigha, sodic	Poor	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
Arvada, thick surface	Poor	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
143:												
Felix, ponded	Poor	Fair	Very poor	Very poor	Very poor	Very poor	Poor	Poor	Poor	Poor	Poor	Poor
144:												
Forkwood	Fair	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair

Wildlife Habitat--Continued

Map symbol and soil name	Potential for habitat elements: Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Shrubs	Wetland plants	Shallow water areas	Potential as habitat for--: Openland wildlife	Woodland wildlife	Wetland wildlife	Rangeland wildlife
145:												
Forkwood	Fair	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
Cambria	Fair	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
146:												
Forkwood	Fair	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
Cushman	Fair	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
147:												
Forkwood	Fair	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
Cushman	Fair	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
148:												
Forkwood	Fair	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
Ulm	Fair	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
149:												
Forkwood	Fair	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
Ulm	Fair	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
150:												
Gateson	Very poor	Poor	Poor	Poor	Fair	Fair	Very poor	Very poor	Poor	Fair	Very poor	Fair
Taluce	Very poor	Poor	Poor	Poor	Fair	Fair	Very poor	Very poor	Poor	Fair	Very poor	Fair
Turnercrest	Very poor	Poor	Poor	Poor	Fair	Fair	Very poor	Very poor	Poor	Fair	Very poor	Fair
151:												
Haverdad	Fair	Fair	Fair	Very poor	Fair	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
152:												
Haverdad	Fair	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
Clarkelen	Fair	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
153:												
Haverdad	Fair	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair

Wildlife Habitat--Continued

Map symbol and soil name	Potential for habitat elements: Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Shrubs	Wetland plants	Shallow water areas	Potential as habitat for--: Openland wildlife	Woodland wildlife	Wetland wildlife	Rangeland wildlife
153: (cont.)												
Kishona	Fair	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
154:												
Heldt	Fair	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
155:												
Heldt, saline	Very poor	Poor	Poor	Very poor	Poor	Poor	Very poor	Very poor	Poor	Poor	Very poor	Poor
Bidman, saline	Very poor	Poor	Poor	Very poor	Poor	Poor	Very poor	Very poor	Poor	Poor	Very poor	Poor
156:												
Hiland	Fair	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
157:												
Hiland	Fair	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
Bowbac	Fair	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
158:												
Hiland	Fair	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
Bowbac	Fair	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
159:												
Hiland	Fair	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
Vonalee	Fair	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
160:												
Hiland	Fair	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
Vonalee	Fair	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
161:												
Hilight	Very poor	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
Taluce, cool	Very poor	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
Wags	Fair	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
162:												
Lismas	Very poor	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair

Wildlife Habitat--Continued

Map symbol and soil name	Potential for habitat elements: Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Shrubs	Wetland plants	Shallow water areas	Potential as habitat for--: Openland wildlife	Woodland wildlife	Wetland wildlife	Rangeland wildlife
162: (cont.)												
Mittenbutte, cool	Very poor	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
Sabatka	Poor	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
163:												
Hilight	Very poor	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
Wags	Poor	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
Badland	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor
164:												
Lismas	Very poor	Fair	Fair	Poor	Fair	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
Sabatka	Poor	Fair	Fair	Poor	Fair	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
Badland	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor
165:												
Jayem	Fair	Fair	Fair	Poor	Fair	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
166:												
Jaywest	Fair	Fair	Fair	Poor	Fair	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
167:												
Jaywest	Fair	Fair	Fair	Poor	Fair	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
Moorhead	Fair	Fair	Fair	Poor	Fair	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
168:												
Jaywest	Fair	Fair	Fair	Poor	Fair	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
Spottedhorse	Fair	Fair	Fair	Poor	Fair	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
169:												
Julesburg	Fair	Fair	Fair	Poor	Fair	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
170:												
Keeline	Fair	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
Tullock	Fair	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair

Wildlife Habitat--Continued

Map symbol and soil name	Potential for habitat elements: Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Shrubs	Wetland plants	Shallow water areas	Potential as habitat for--: Openland wildlife	Woodland wildlife	Wetland wildlife	Rangeland wildlife
171:												
Keeline	Fair	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
Tullock	Fair	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
Niobrara, dry	Very poor	Poor	Poor	Very poor	Poor	Poor	Very poor	Very poor	Poor	Poor	Very poor	Poor
172:												
Keyner	Poor	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
173:												
Lawver	Poor	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
Teckla	Poor	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
Wibaux	Very poor	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
174:												
Brislawn	Poor	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
Rockybutte	Poor	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
Ironbutte	Very poor	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
175:												
Lawver	Poor	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
Wibaux	Very poor	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
176:												
Leiter	Fair	Fair	Fair	Poor	Fair	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
Cromack	Fair	Fair	Fair	Poor	Fair	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
177:												
Maysdorf	Fair	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
178:												
Maysdorf	Fair	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
179:												
Maysdorf	Fair	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair

Wildlife Habitat--Continued

Map symbol and soil name	Potential for habitat elements: Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Shrubs	Wetland plants	Shallow water areas	Potential as habitat for--: Openland wildlife	Woodland wildlife	Wetland wildlife	Rangeland wildlife
179: (cont.)												
Pugsley	Fair	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
180:												
Maysdorf	Fair	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
Pugsley	Fair	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
181:												
Moorhead	Fair	Fair	Fair	Poor	Fair	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
182:												
Moorhead	Fair	Fair	Fair	Poor	Fair	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
183:												
Moorhead	Fair	Fair	Fair	Poor	Fair	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
Leiter	Fair	Fair	Fair	Poor	Fair	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
184:												
Moorhead	Fair	Fair	Fair	Poor	Fair	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
Leiter	Fair	Fair	Fair	Poor	Fair	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
185:												
Moskee	Fair	Fair	Fair	Poor	Fair	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
186:												
Moskee	Fair	Fair	Fair	Poor	Fair	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
187:												
Nuncho	Fair	Fair	Fair	Poor	Fair	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
188:												
Orpha	Poor	Poor	Poor	Very poor	Poor	Poor	Very poor	Very poor	Poor	Poor	Very poor	Poor
Tullock	Poor	Poor	Poor	Very poor	Poor	Poor	Very poor	Very poor	Poor	Poor	Very poor	Poor
189:												
Oshoto	Fair	Fair	Fair	Poor	Fair	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
Moorhead	Fair	Fair	Fair	Poor	Fair	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair

Wildlife Habitat--Continued

Map symbol and soil name	Potential for habitat elements: Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Shrubs	Wetland plants	Shallow water areas	Potential as habitat for--: Openland wildlife	Woodland wildlife	Wetland wildlife	Rangeland wildlife
190:												
Parmleed	Fair	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
Renohill	Fair	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
191:												
Pits	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor
Dumps	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor
192:												
Platmak	Fair	Fair	Fair	Poor	Fair	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
193:												
Pugsley	Fair	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
Decolney	Fair	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
194:												
Pugsley	Fair	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
Decolney	Fair	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
195:												
Rauzi	Fair	Fair	Fair	Poor	Fair	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
196:												
Rauzi	Fair	Fair	Fair	Poor	Fair	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
197:												
Rauzi	Fair	Fair	Fair	Poor	Fair	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
Elwop	Fair	Fair	Fair	Poor	Fair	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
198:												
Recluse	Fair	Fair	Fair	Poor	Fair	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
199:												
Renohill	Fair	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
Savageton	Fair	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
200:												
Renohill	Fair	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair

Wildlife Habitat--Continued

Map symbol and soil name	Potential for habitat elements								Potential as habitat for--			
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Shrubs	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife	Rangeland wildlife
200: (cont.)												
Savageton	Fair	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
201:												
Renohill	Fair	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
Shingle	Poor	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
Worf	Poor	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
202:												
Renohill	Fair	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
Worfka	Poor	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
203:												
Rockypoint	Fair	Fair	Fair	Poor	Fair	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
Iwait	Fair	Fair	Fair	Poor	Fair	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
204:												
Samday	Poor	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
Samday, cool	Very poor	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
Shingle	Poor	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
205:												
Samday	Poor	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
Savageton	Fair	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
206:												
Samday	Poor	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
Shingle	Poor	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
Badland	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor
207:												
Cromack	Fair	Fair	Fair	Poor	Fair	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair

Wildlife Habitat--Continued

Map symbol and soil name	Potential for habitat elements: Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Shrubs	Wetland plants	Shallow water areas	Potential as habitat for--: Openland wildlife	Woodland wildlife	Wetland wildlife	Rangeland wildlife
207: (cont.)												
Fairburn	Poor	Fair	Fair	Poor	Fair	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
Ucross	Fair	Fair	Fair	Poor	Fair	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
208:												
Savageton	Fair	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
Silhouette	Fair	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
209:												
Savageton	Fair	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
Silhouette	Fair	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
210:												
Shingle	Poor	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
Taluce	Poor	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
211:												
Shingle	Poor	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
Worf	Poor	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
212:												
Teckla	Poor	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
213:												
Terro	Poor	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
Taluce	Poor	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
214:												
Theedle	Fair	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
Kishona	Fair	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
215:												
Theedle	Fair	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
Kishona	Fair	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair

Wildlife Habitat--Continued

Map symbol and soil name	Potential for habitat elements: Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Shrubs	Wetland plants	Shallow water areas	Potential as habitat for--: Openland wildlife	Woodland wildlife	Wetland wildlife	Rangeland wildlife
216:												
Theedle	Fair	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
Kishona	Fair	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
Shingle	Poor	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
217:												
Theedle	Fair	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
Shingle	Poor	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
218:												
Theedle	Fair	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
Turnercrest	Poor	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
Kishona	Fair	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
219:												
Torriarents	Poor	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
Torriorthents	Poor	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
220:												
Pitchdraw	Fair	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
Ashollow	Fair	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
Niobrara	Poor	Poor	Poor	Very poor	Poor	Poor	Very poor	Very poor	Poor	Poor	Very poor	Poor
221:												
Turnercrest	Fair	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
Keeline	Fair	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
Taluce	Poor	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
222:												
Turnercrest	Poor	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
Wibaux, thin solum	Very poor	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair

Wildlife Habitat--Continued

Map symbol and soil name	Potential for habitat elements								Potential as habitat for--			
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Shrubs	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife	Rangeland wildlife
222: (cont.)												
Taluce	Poor	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
223:												
Ucross	Fair	Fair	Fair	Poor	Fair	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
224:												
Ucross	Fair	Fair	Fair	Poor	Fair	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
Iwait	Fair	Fair	Fair	Poor	Fair	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
225:												
Ucross	Fair	Fair	Fair	Poor	Fair	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
Iwait	Fair	Fair	Fair	Poor	Fair	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
Fairburn	Poor	Fair	Fair	Poor	Fair	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
226:												
Ulm	Fair	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
227:												
Ulm	Fair	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
228:												
Ulm	Fair	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
Renohill	Fair	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
229:												
Ulm	Fair	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
Renohill	Fair	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
230:												
Urban land	---	---	---	---	---	---	---	---	---	---	---	---
Deekay	Poor	Fair	Poor	Poor	Fair	Fair	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor
Moorhead	Poor	Fair	Poor	Poor	Fair	Fair	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor
231:												
Urban land	---	---	---	---	---	---	---	---	---	---	---	---

Wildlife Habitat--Continued

Map symbol and soil name	Potential for habitat elements: Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Shrubs	Wetland plants	Shallow water areas	Potential as habitat for--: Openland wildlife	Woodland wildlife	Wetland wildlife	Rangeland wildlife
231: (cont.)												
Leiter	Very poor	Fair	Very poor	Poor	Fair	Fair	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor
Moorhead	Very poor	Fair	Very poor	Poor	Fair	Fair	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor
232:												
Urban land	---	---	---	---	---	---	---	---	---	---	---	---
Pitchdraw	Very poor	Fair	Very poor	Poor	Fair	Fair	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor
Ashollow	Very poor	Fair	Very poor	Poor	Fair	Fair	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor
233:												
Ustic Torriorthents	Very poor	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
234:												
Ustic Torriorthents	Very poor	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
Badland	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor
235:												
Vonalee	Fair	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
236:												
Vonalee	Fair	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
Terro	Poor	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
237:												
Vonalf	Fair	Fair	Fair	Poor	Fair	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
238:												
Vonalf	Fair	Fair	Fair	Poor	Fair	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
Xema	Poor	Fair	Fair	Poor	Fair	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
239:												
Ironbutte	Poor	Fair	Fair	Poor	Fair	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
Fairburn	Poor	Fair	Fair	Poor	Fair	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
Mittenbutte	Poor	Fair	Fair	Poor	Fair	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair

Wildlife Habitat--Continued

Map symbol and soil name	Potential for habitat elements: Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Shrubs	Wetland plants	Shallow water areas	Potential as habitat for--: Openland wildlife	Woodland wildlife	Wetland wildlife	Rangeland wildlife
240:												
Wibaux	Poor	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
Wibaux, thin solum	Very poor	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
241:												
Ironbutte	Poor	Fair	Fair	Poor	Fair	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
Ironbutte, thin solum	Very poor	Fair	Fair	Poor	Fair	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
242:												
Ironbutte	Poor	Fair	Fair	Poor	Fair	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
Deekay	Fair	Fair	Fair	Poor	Fair	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
Moorhead	Fair	Fair	Fair	Poor	Fair	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
243:												
Wibaux, thick solum	Fair	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
Wibaux	Poor	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
244:												
Muleherder	Fair	Fair	Fair	Poor	Fair	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
Ironbutte	Poor	Fair	Fair	Poor	Fair	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
245:												
Wibaux	Poor	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
Shingle	Poor	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
Badland	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor
246:												
Wyarno	Fair	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
Ulm	Fair	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
247:												
Wyotite	Fair	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair

Wildlife Habitat--Continued

Map symbol and soil name	Potential for habitat elements: Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Shrubs	Wetland plants	Shallow water areas	Potential as habitat for--: Openland wildlife	Woodland wildlife	Wetland wildlife	Rangeland wildlife
247: (cont.)												
Ulm	Fair	Fair	Fair	Very poor	Poor	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
248:												
Ziggy	Fair	Fair	Fair	Poor	Fair	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
Iwait	Fair	Fair	Fair	Poor	Fair	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
249:												
Ziggy	Fair	Fair	Fair	Poor	Fair	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
Iwait	Fair	Fair	Fair	Poor	Fair	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
250:												
Ziggy	Fair	Fair	Fair	Poor	Fair	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
Ucross	Fair	Fair	Fair	Poor	Fair	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
Oldwolf	Fair	Fair	Fair	Poor	Fair	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair

Engineering

This section provides information for planning land uses related to urban development and to water management. Soils are rated for various uses, and the most limiting features are identified. Ratings are given for building site development, sanitary facilities, construction materials, and water management. The ratings are based on observed performance of the soils and on the estimated data and test data in the "Soil Properties" section.

Information in this section is intended for land use planning, for evaluating land use alternatives, and for planning site investigations prior to design and construction. The information, however, has limitations. For example, estimates and other data generally apply only to that part of the soil within a depth of 5 or 6 feet. Because of the map scale, small areas of different soils may be included within the mapped areas of a specific soil.

The information is not site specific and does not eliminate the need for onsite investigation of the soils or for testing and analysis by personnel experienced in the design and construction of engineering works.

Government ordinances and regulations that restrict certain land uses or impose specific design criteria were not considered in preparing the information in this section. Local ordinances and regulations should be considered in planning, in site selection, and in design.

Soil properties, site features, and observed performance were considered in determining the ratings in this section. During the fieldwork for this soil survey, determinations were made about grain-size distribution, liquid limit, plasticity index, soil reaction, depth to bedrock, hardness of bedrock within 5 or 6 feet of the surface, soil wetness, depth to a seasonal high water table, slope, likelihood of flooding, natural soil structure aggregation, and soil density. Data were collected about kinds of clay minerals, mineralogy of the sand and silt fractions, and the kinds of adsorbed cations. Estimates were made for erodibility, permeability, corrosivity, shrink-swell potential, available water capacity, and other behavioral characteristics affecting engineering uses.

This information can be used to evaluate the potential of areas for residential, commercial, industrial, and recreational uses; make preliminary estimates of construction conditions; evaluate alternative routes for roads, streets, highways, pipelines, and underground cables; evaluate alternative sites for sanitary landfills, septic tank absorption fields, and sewage lagoons; plan detailed onsite investigations of soils and geology; locate potential sources of gravel, sand, earthfill, and topsoil; plan drainage systems, irrigation systems, ponds, terraces, and other structures for soil and water conservation; and predict performance of proposed small structures and pavements by comparing the performance of existing similar structures on the same or similar soils.

The information in the tables, along with the soil maps, the soil descriptions, and other data provided in this survey, can be used to make additional interpretations.

Some of the terms used in this soil survey have a special meaning in soil science and are defined in the Glossary.

Building Site Development

The table, "Building Site Development," shows the degree and kind of soil limitations that affect shallow excavations, dwellings with and without basements, small commercial buildings, local roads and streets, and lawns and landscaping. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increases in construction costs, and possibly increased maintenance are required. Special feasibility studies may be required where the soil limitations are severe.

Shallow excavations are trenches or holes dug to a maximum depth of 5 or 6 feet for basements, graves, utility lines, open ditches, or other purposes. The ratings are based on soil properties, site features, and observed performance of the soils. The ease of digging, filling, and compacting is affected by the depth to bedrock, a cemented pan, or a very firm dense layer; stone content; soil texture; and slope. The time of the year that excavations can be made is affected by the depth to a seasonal high water table and the susceptibility of the soil to flooding. The resistance of the excavation walls or banks to sloughing or caving is affected by soil texture and depth to the water table.

Dwellings and *small commercial buildings* are structures built on shallow foundations on undisturbed soil. The load limit is the same as that for single-family dwellings no higher than three stories. Ratings are made for small commercial buildings without basements, for dwellings with basements, and for dwellings without basements. The ratings are based on soil properties, site features, and observed performance of the soils. A high water table, flooding, shrinking and swelling, and organic layers can cause the movement of footings. A high water table, depth to bedrock or to a cemented pan, large stones, slope, and flooding affect the ease of excavation and construction. Landscaping and grading that require cuts and fills of more than 5 or 6 feet are not considered.

Local roads and streets have an all-weather surface and carry automobile and light truck traffic all year. They have a subgrade of cut or fill soil material; a base of gravel, crushed rock, or stabilized soil material; and a flexible or rigid surface. Cuts and fills are generally limited to less than 6 feet. The ratings are based on soil properties, site features, and observed performance of the soils. Depth to bedrock or to a cemented pan, a high water table, flooding, large stones, and slope affect the ease of excavating and grading. Soil strength (as inferred from the engineering classification of the soil), shrink-swell potential, frost action potential, and depth to a high water table affect the traffic-supporting capacity.

Lawns and landscaping require soils on which turf and ornamental trees and shrubs can be established and maintained. The ratings are based on soil properties, site features, and observed performance of the soils. Soil reaction, a high water table, depth to bedrock or to a cemented pan, the available water capacity in the upper 40 inches, and the content of salts, sodium, and sulfidic materials affect plant growth. Flooding, wetness, slope, stoniness, and the amount of sand, clay, or organic matter in the surface layer affect trafficability after vegetation is established.

Sanitary Facilities

The table, "Sanitary Facilities," shows the degree and kind of soil limitations that affect septic tank absorption fields, sewage lagoons, and sanitary landfills. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increases in construction costs, and possibly increased maintenance are required.

The table also shows the suitability of the soils for use as *daily cover for landfill.* A rating of *good* indicates that soil properties and site features are favorable for the use and good performance and low maintenance can be expected; *fair* indicates that soil properties and site features are moderately favorable for the use and one or more soil properties or site features make the soil less desirable than the soils rated good; and *poor* indicates that one or more soil properties or site features are unfavorable for the use and overcoming the unfavorable properties requires special design, extra maintenance, or costly alteration.

Septic tank absorption fields are areas in which effluent from a septic tank is distributed into the soil through subsurface tiles or perforated pipe. Only that part of the soil between depths of 24 and 72 inches is evaluated. The ratings are based on soil properties, site features, and observed performance of the soils. Permeability, a high water table, depth to bedrock or to a cemented pan, and flooding affect absorption of the effluent. Large stones and bedrock or a cemented pan interfere with installation.

Unsatisfactory performance of septic tank absorption fields, including excessively slow absorption of effluent, surfacing of effluent, and hillside seepage, can affect public health. Ground water can be polluted if highly permeable sand and gravel or fractured bedrock is less than 4 feet below the base of the absorption field, if slope is excessive, or if the water table is near the surface. There must be unsaturated soil material beneath the absorption field to filter the effluent effectively. Many local ordinances require that this material be of a certain thickness.

Sewage lagoons are shallow ponds constructed to hold sewage while aerobic bacteria decompose the solid and liquid wastes. Lagoons should have a nearly level floor surrounded by cut slopes or embankments of compacted soil. Lagoons generally are designed to hold the sewage within a depth of 2 to 5 feet. Nearly impervious soil material for the lagoon floor and sides is required to minimize seepage and contamination of ground water.

The table gives ratings for the natural soil that makes up the lagoon floor. The surface layer and, generally, 1 or 2 feet of soil material below the surface layer are excavated to provide material for the embankments. The ratings are based on soil properties, site features, and observed performance of the soils. Considered in the ratings are slope, permeability, a high water table, depth to bedrock or to a cemented pan, flooding, large stones, and content of organic matter.

Excessive seepage resulting from rapid permeability in the soil or a water table that is high enough to raise the level of sewage in the lagoon causes a lagoon to function unsatisfactorily. Pollution results if seepage is excessive or if floodwater overtops the lagoon. A high content of organic matter is detrimental to proper functioning of the lagoon because it inhibits aerobic activity. Slope, bedrock, and cemented pans can cause construction problems, and large stones can hinder compaction of the lagoon floor.

Sanitary landfills are areas where solid waste is disposed of by burying it in soil. There are two types of landfill—trench and area. In a trench landfill, the waste is placed in a trench. It is spread, compacted, and covered daily with a thin layer of soil excavated at the site. In an area landfill, the waste is placed in successive layers on the surface of the soil. The waste is spread, compacted, and covered daily with a thin layer of soil from a source away from the site.

Both types of landfill must be able to bear heavy vehicular traffic. Both types involve a risk of groundwater pollution. Ease of excavation and revegetation should be considered.

The ratings in the table are based on soil properties, site features, and observed performance of the soils. Permeability, depth to bedrock or to a cemented pan, a high water table, slope, and flooding affect both types of landfill. Texture, stones and boulders, highly organic layers, soil reaction, and content of salts and sodium affect trench landfills. Unless otherwise stated, the ratings apply only to that part of the soil within a depth of about 6 feet. For deeper trenches, a limitation rated slight or moderate may not be valid. Onsite investigation is needed.

Daily cover for landfill is the soil material that is used to cover compacted solid waste in an area sanitary landfill. The soil material is obtained offsite, transported to the landfill, and spread over the waste.

Soil texture, wetness, coarse fragments, and slope affect the ease of removing and spreading the material during wet and dry periods. Loamy or silty soils that are free of large stones or excess gravel are the best cover for a landfill. Clayey soils are sticky or cloddy and are difficult to spread; sandy soils are subject to wind erosion.

After soil material has been removed, the soil material remaining in the borrow area must be thick enough over bedrock, a cemented pan, or the water table to permit revegetation. The soil material used as the final cover for a landfill should be suitable for plants. The surface layer generally has the best workability, more organic matter, and the best potential for plants. Material from the surface layer should be stockpiled for use as the final cover.

Construction Materials

The table, "Construction Materials," gives information about the soils as a source of roadfill, sand, gravel, and topsoil. The soils are rated *good, fair,* or *poor* as a source of roadfill and topsoil. They are rated as a *probable* or *improbable* source of sand and gravel. The ratings are based on soil properties and site features that affect the removal of the soil and its use as construction material. Normal compaction, minor processing, and other standard construction practices are assumed. Each soil is evaluated to a depth of 5 or 6 feet.

Roadfill is soil material that is excavated in one place and used in road embankments in another place. In this table, the soils are rated as a source of roadfill for low embankments, generally less than 6 feet high and less exacting in design than higher embankments.

The ratings are for the soil material below the surface layer to a depth of 5 or 6 feet. It is assumed that soil layers will be mixed during excavating and spreading. Many soils have layers of contrasting suitability within their profile. The table showing engineering index properties provides detailed information about each soil layer. This information can help to determine the suitability of each layer for use as roadfill. The performance of soil after it is stabilized with lime or cement is not considered in the ratings.

The ratings are based on soil properties, site features, and observed performance of the soils. The thickness of suitable material is a major

consideration. The ease of excavation is affected by large stones, a high water table, and slope. How well the soil performs in place after it has been compacted and drained is determined by its strength (as inferred from the engineering classification of the soil) and shrink-swell potential.

Soils rated *good* contain significant amounts of sand or gravel or both. They have at least 5 feet of suitable material, a low shrink-swell potential, few cobbles and stones, and slopes of 15 percent or less. Depth to the water table is more than 3 feet. Soils rated *fair* are more than 35 percent silt- and clay-sized particles and have a plasticity index of less than 10. They have a moderate shrink-swell potential, slopes of 15 to 25 percent, or many stones. Depth to the water table is 1 to 3 feet. Soils rated *poor* have a plasticity index of more than 10, a high shrink-swell potential, many stones, or slopes of more than 25 percent. They are wet and have a water table at a depth of less than 1 foot. They may have layers of suitable material, but the material is less than 3 feet thick.

Sand and *gravel* are natural aggregates suitable for commercial use with a minimum of processing. They are used in many kinds of construction. Specifications for each use vary widely. Only the probability of finding material in suitable quantity is evaluated. The suitability of the material for specific purposes is not evaluated, nor are factors that affect excavation of the material.

The properties used to evaluate the soil as a source of sand or gravel are gradation of grain sizes (as indicated by the engineering classification of the soil), the thickness of suitable material, and the content of rock fragments. Kinds of rock, acidity, and stratification are given in the soil series descriptions. Gradation of grain sizes is given in the table on engineering index properties.

A soil rated as a probable source has a layer of clean sand or gravel or a layer of sand or gravel that is up to 12 percent silty fines. This material must be at least 3 feet thick and less than 50 percent, by weight, large stones. All other soils are rated as an improbable source. Coarse fragments of soft bedrock, such as shale and siltstone, are not considered to be sand and gravel.

Topsoil is used to cover an area so that vegetation can be established and maintained. The upper 40 inches of a soil is evaluated for use as topsoil. Also evaluated is the reclamation potential of the borrow area.

Plant growth is affected by toxic material and by such properties as soil reaction, available water capacity, and fertility. The ease of excavating, loading, and spreading is affected by rock fragments, slope, a water table, soil texture, and thickness of suitable material. Reclamation of the borrow area is affected by slope, a water table, rock fragments, bedrock, and toxic material.

Soils rated *good* have friable, loamy material to a depth of at least 40 inches. They are free of stones and cobbles, have little or no gravel, and have slopes of less than 8 percent. They are low in content of soluble salts, are naturally fertile or respond well to fertilizer, and are not so wet that excavation is difficult.

Soils rated *fair* are sandy soils, loamy soils that have a relatively high content of clay, soils that have only 20 to 40 inches of suitable material, soils that have an appreciable amount of gravel, stones, or soluble salts, or soils that have slopes of 8 to 15 percent. The soils are not so wet that excavation is difficult.

Soils rated *poor* are very sandy or clayey, have less than 20 inches of suitable material, have a large amount of gravel, stones, or soluble salts, have slopes of more than 15 percent, or have a seasonal high water table at or near the surface.

The surface layer of most soils is generally preferred for topsoil because of its organic matter content. Organic matter greatly increases the absorption and retention of moisture and nutrients for plant growth.

Water Management

The table, "Water Management," gives information on the soil properties and site features that affect water management. The degree and kind of soil limitations are given for pond reservoir areas; embankments, dikes, and levees; and aquifer-fed excavated ponds. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and are easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increase in construction costs, and possibly increased maintenance are required.

This table also gives for each soil the restrictive features that affect drainage, irrigation, terraces and diversions, and grassed waterways.

Pond reservoir areas hold water behind a dam or embankment. Soils best suited to this use have low

seepage potential in the upper 60 inches. The seepage potential is determined by the permeability of the soil and the depth to fractured bedrock or other permeable material. Excessive slope can affect the storage capacity of the reservoir area.

Embankments, dikes, and levees are raised structures of soil material, generally less than 20 feet high, constructed to impound water or to protect land against overflow. In this table, the soils are rated as a source of material for embankment fill. The ratings apply to the soil material below the surface layer to a depth of about 5 feet. It is assumed that soil layers will be uniformly mixed and compacted during construction.

The ratings do not indicate the ability of the natural soil to support an embankment. Soil properties to a depth even greater than the height of the embankment can affect performance and safety of the embankment. Generally, deeper onsite investigation is needed to determine these properties.

Soil material in embankments must be resistant to seepage, piping, and erosion and have favorable compaction characteristics. Unfavorable features include less than 5 feet of suitable material and a high content of stones or boulders, organic matter, or salts or sodium. A high water table affects the amount of usable material. It also affects trafficability.

Aquifer-fed excavated ponds are pits or dugouts that extend to a ground-water aquifer or to a depth below a permanent water table. Excluded are ponds that are fed only by surface runoff and embankment ponds that impound water 3 feet or more above the original surface. Excavated ponds are affected by depth to a permanent water table, permeability of the aquifer, and quality of the water as inferred from the salinity of the soil. Depth to bedrock and the content of large stones affect the ease of excavation.

Drainage is the removal of excess surface and subsurface water from the soil. How easily and effectively the soil is drained depends on the depth to bedrock, to a cemented pan, or to other layers that affect the rate of water movement; permeability; depth to a high water table or depth of standing water if the soil is subject to ponding; slope; susceptibility to flooding; subsidence of organic layers; and the potential for frost action. Excavating and grading and the stability of ditchbanks are affected by depth to bedrock or to a cemented pan, large stones, slope, and the hazard of cutbanks caving. The productivity of the soil after drainage is adversely affected by extreme acidity or by toxic substances in the root zone, such as salts, sodium, and sulfur. Availability of drainage outlets is not considered in the ratings.

Irrigation is the controlled application of water to supplement rainfall and support plant growth. The design and management of an irrigation system are affected by depth to the water table, the need for drainage, flooding, available water capacity, intake rate, permeability, erosion hazard, and slope. The construction of a system is affected by large stones and depth to bedrock or to a cemented pan. The performance of a system is affected by the depth of the root zone, the amount of salts or sodium, and soil reaction.

Terraces and diversions are embankments or a combination of channels and ridges constructed across a slope to control erosion and conserve moisture by intercepting runoff. Slope, wetness, large stones, and depth to bedrock or to a cemented pan affect the construction of terraces and diversions. A restricted rooting depth, a severe hazard of wind erosion or water erosion, an excessively coarse texture, and restricted permeability adversely affect maintenance.

Grassed waterways are natural or constructed channels, generally broad and shallow, that conduct surface water to outlets at a nonerosive velocity. Large stones, wetness, slope, and depth to bedrock or to a cemented pan affect the construction of grassed waterways. A hazard of wind erosion, low available water capacity, restricted rooting depth, toxic substances such as salts and sodium, and restricted permeability adversely affect the growth and maintenance of the grass after construction.

Building Site Development

(Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation.)

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
100:						
Aridic Ustorthents, saline	Moderate: too clayey	Moderate: shrink-swell	Moderate: shrink-swell	Moderate: shrink-swell	Severe: low strength	Moderate: droughty
101:						
Arvada, thick surface	Moderate: too clayey	Severe: shrink-swell	Severe: shrink-swell	Severe: shrink-swell	Severe: low strength shrink-swell	Severe: excess sodium
102:						
Arvada, thick surface	Moderate: too clayey	Severe: shrink-swell	Severe: shrink-swell	Severe: shrink-swell	Severe: low strength shrink-swell	Severe: excess sodium
Arvada	Moderate: too clayey	Severe: shrink-swell	Severe: shrink-swell	Severe: shrink-swell	Severe: low strength shrink-swell	Severe: excess sodium
Slickspots	---	---	---	---	---	---
103:						
Arwite	Slight	Slight	Slight	Slight	Moderate: frost action	Slight
104:						
Arwite	Moderate: slope	Moderate: slope	Moderate: slope	Severe: slope	Moderate: frost action slope	Moderate: slope
105:						
Arwite	Slight	Slight	Slight	Slight	Moderate: frost action	Slight
Elwop	Moderate: depth to rock	Moderate: shrink-swell	Moderate: shrink-swell depth to rock	Moderate: shrink-swell	Moderate: frost action shrink-swell	Moderate: depth to rock
106:						
Arwite	Moderate: slope	Moderate: slope	Moderate: slope	Severe: slope	Moderate: frost action slope	Moderate: slope
Elwop	Moderate: slope depth to rock	Moderate: slope	Moderate: slope depth to rock	Severe: slope	Moderate: frost action slope	Moderate: slope depth to rock
107:						
Arwite	Slight	Slight	Slight	Slight	Moderate: frost action	Slight
Vonalf	Slight	Slight	Slight	Slight	Moderate: frost action	Slight
108:						
Arwite	Moderate: slope	Moderate: slope	Moderate: slope	Severe: slope	Moderate: frost action slope	Moderate: slope

Building Site Development--Continued

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
108: (cont.)						
Vonalf	Moderate: slope	Moderate: slope	Moderate: slope	Severe: slope	Moderate: frost action slope	Moderate: slope
109:						
Bidman	Moderate: too clayey	Moderate: shrink-swell	Moderate: shrink-swell	Moderate: shrink-swell	Severe: low strength	Slight
110:						
Bidman, loamy substratum	Moderate: too clayey	Severe: shrink-swell	Moderate: shrink-swell	Severe: shrink-swell	Severe: low strength shrink-swell	Slight
111:						
Bidman	Moderate: too clayey	Moderate: shrink-swell	Moderate: shrink-swell	Moderate: shrink-swell	Severe: low strength	Slight
Parmleed	Moderate: too clayey depth to rock	Moderate: shrink-swell	Moderate: shrink-swell depth to rock	Moderate: shrink-swell	Severe: low strength	Moderate: depth to rock
112:						
Bidman	Moderate: slope too clayey	Moderate: shrink-swell slope	Moderate: shrink-swell slope	Severe: slope	Severe: low strength	Moderate: slope
Parmleed	Moderate: slope too clayey depth to rock	Moderate: shrink-swell slope	Moderate: shrink-swell slope depth to rock	Severe: slope	Severe: low strength	Moderate: slope depth to rock
113:						
Bidman	Moderate: too clayey	Severe: shrink-swell	Severe: shrink-swell	Severe: shrink-swell	Severe: low strength shrink-swell	Slight
Ulm	Moderate: too clayey	Severe: shrink-swell	Moderate: shrink-swell	Severe: shrink-swell	Severe: low strength shrink-swell	Slight
114:						
Bowbac	Moderate: slope depth to rock	Moderate: slope	Moderate: slope depth to rock	Severe: slope	Moderate: slope	Moderate: slope depth to rock
Taluce	Severe: depth to rock	Moderate: slope depth to rock	Severe: depth to rock	Severe: slope	Moderate: slope depth to rock	Severe: depth to rock
Badland	Severe: depth to rock	Moderate: depth to rock	Severe: depth to rock	Moderate: depth to rock	Moderate: depth to rock	Severe: depth to rock droughty
115:						
Bowbac	Moderate: slope depth to rock	Moderate: slope	Moderate: slope depth to rock	Severe: slope	Moderate: slope	Moderate: slope depth to rock

Building Site Development--Continued

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
115: (cont.)						
Worf	Severe: depth to rock	Moderate: shrink-swell slope depth to rock	Severe: depth to rock	Severe: slope	Moderate: low strength shrink-swell depth to rock	Severe: depth to rock
116:						
Cambria	Slight	Moderate: shrink-swell	Moderate: shrink-swell	Moderate: shrink-swell	Moderate: low strength shrink-swell	Slight
Kishona	Slight	Moderate: shrink-swell	Moderate: shrink-swell	Moderate: shrink-swell	Severe: low strength	Slight
Zigweid	Slight	Moderate: shrink-swell	Moderate: shrink-swell	Moderate: shrink-swell	Severe: low strength	Slight
117:						
Cambria	Moderate: slope	Moderate: shrink-swell slope	Moderate: shrink-swell slope	Severe: slope	Moderate: low strength shrink-swell slope	Moderate: slope
Kishona	Moderate: slope	Moderate: shrink-swell slope	Moderate: shrink-swell slope	Severe: slope	Severe: low strength	Moderate: slope
Zigweid	Moderate: slope	Moderate: shrink-swell slope	Moderate: shrink-swell slope	Severe: slope	Severe: low strength	Moderate: slope
118:						
Clarkelen	Severe: cutbanks cave	Severe: flooding	Severe: flooding	Severe: flooding	Severe: flooding	Moderate: flooding
Draknab	Severe: cutbanks cave	Severe: flooding	Severe: flooding	Severe: flooding	Severe: flooding	Moderate: flooding droughty
119:						
Clarkelen	Severe: cutbanks cave	Severe: flooding	Severe: flooding	Severe: flooding	Severe: flooding	Moderate: flooding
Embry	Slight	Slight	Slight	Slight	Slight	Slight
120:						
Clarkelen	Severe: cutbanks cave	Severe: flooding	Severe: flooding	Severe: flooding	Severe: flooding	Moderate: flooding
Keeline	Slight	Slight	Slight	Slight	Slight	Slight
121:						
Cushman	Moderate: depth to rock	Moderate: shrink-swell	Moderate: shrink-swell depth to rock	Moderate: shrink-swell	Severe: low strength	Moderate: depth to rock
Cambria	Slight	Moderate: shrink-swell	Moderate: shrink-swell	Moderate: shrink-swell	Moderate: low strength shrink-swell	Slight

Building Site Development--Continued

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
122:						
Cushman---------------	Moderate: slope depth to rock	Moderate: shrink-swell slope	Moderate: shrink-swell slope depth to rock	Severe: slope	Severe: low strength	Moderate: slope depth to rock
Cambria---------------	Moderate: slope	Moderate: shrink-swell slope	Moderate: shrink-swell slope	Severe: slope	Moderate: low strength shrink-swell slope	Moderate: slope
123:						
Cushman---------------	Moderate: slope depth to rock	Moderate: shrink-swell slope	Moderate: shrink-swell slope depth to rock	Severe: slope	Severe: low strength	Moderate: slope depth to rock
Renohill--------------	Moderate: slope depth to rock	Moderate: shrink-swell slope	Moderate: shrink-swell slope depth to rock	Severe: slope	Severe: low strength	Moderate: slope depth to rock
124:						
Cushman---------------	Moderate: slope depth to rock	Moderate: shrink-swell slope	Moderate: shrink-swell slope depth to rock	Severe: slope	Severe: low strength	Moderate: slope depth to rock
Shingle---------------	Severe: depth to rock	Moderate: shrink-swell slope depth to rock	Severe: depth to rock	Severe: slope	Severe: low strength	Severe: depth to rock
125:						
Cushman---------------	Moderate: slope depth to rock	Moderate: shrink-swell slope	Moderate: shrink-swell slope depth to rock	Severe: slope	Severe: low strength	Moderate: slope depth to rock
Terro-----------------	Severe: cutbanks cave	Moderate: slope	Moderate: slope depth to rock	Severe: slope	Moderate: slope	Moderate: slope depth to rock droughty
126:						
Cushman---------------	Moderate: depth to rock	Moderate: shrink-swell	Moderate: shrink-swell depth to rock	Moderate: shrink-swell	Severe: low strength	Moderate: depth to rock
Theedle---------------	Moderate: depth to rock	Moderate: shrink swell	Moderate: shrink-swell depth to rock	Moderate: shrink-swell	Severe: low strength	Moderate: depth to rock
127:						
Cushman---------------	Moderate: slope depth to rock	Moderate: shrink-swell slope	Moderate: shrink-swell slope depth to rock	Severe: slope	Severe: low strength	Moderate: slope depth to rock

Building Site Development--Continued

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
127: (cont.)						
Theedle	Moderate: slope depth to rock	Moderate: shrink-swell slope	Moderate: shrink-swell slope depth to rock	Severe: slope	Severe: low strength	Moderate: slope depth to rock
128:						
Cushman	Moderate: slope depth to rock	Moderate: shrink-swell slope	Moderate: shrink-swell slope depth to rock	Severe: slope	Severe: low strength	Moderate: slope depth to rock
Worf	Severe: depth to rock	Moderate: shrink-swell slope depth to rock	Severe: depth to rock	Severe: slope	Moderate: low strength shrink-swell depth to rock	Severe: depth to rock
129:						
Decolney	Slight	Slight	Slight	Slight	Slight	Slight
Hiland	Slight	Slight	Slight	Slight	Slight	Slight
130:						
Decolney	Moderate: slope	Moderate: slope	Moderate: slope	Severe: slope	Moderate: slope	Moderate: slope
Hiland	Moderate: slope	Moderate: shrink-swell slope	Moderate: slope	Severe: slope	Moderate: shrink-swell slope	Moderate: slope
131:						
Deekay	Slight	Slight	Slight	Slight	Moderate: frost action low strength	Slight
132:						
Deekay	Slight	Moderate: shrink-swell	Slight	Moderate: shrink-swell	Severe: low strength	Slight
Moorhead	Moderate: too clayey	Severe: shrink-swell	Moderate: shrink-swell	Severe: shrink-swell	Severe: low strength shrink-swell	Slight
133:						
Deekay	Moderate: slope	Moderate: slope	Moderate: slope	Severe: slope	Moderate: frost action low strength slope	Moderate: slope
Moorhead	Moderate: slope too clayey	Moderate: shrink-swell slope	Moderate: shrink-swell slope	Severe: slope	Severe: low strength	Moderate: slope
134:						
Deekay	Slight	Slight	Slight	Slight	Moderate: frost action low strength	Slight
Oldwolf	Moderate: depth to rock	Slight	Moderate: depth to rock	Slight	Moderate: frost action low strength	Moderate: depth to rock

Building Site Development--Continued

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
135:						
Deekay	Moderate: slope	Moderate: slope	Moderate: slope	Severe: slope	Moderate: frost action low strength slope	Moderate: slope
Oldwolf	Moderate: slope depth to rock	Moderate: slope	Moderate: slope depth to rock	Severe: slope	Moderate: frost action low strength slope	Moderate: slope depth to rock
136:						
Deekay	Slight	Slight	Slight	Slight	Moderate: frost action low strength	Slight
Ziggy	Slight	Moderate: shrink-swell	Moderate: shrink-swell	Moderate: shrink-swell	Severe: low strength	Slight
137:						
Echeta	Moderate: too clayey	Severe: shrink-swell	Severe: shrink-swell	Severe: shrink-swell	Severe: low strength shrink-swell	Slight
138:						
Echeta	Moderate: slope too clayey	Severe: shrink-swell	Severe: shrink-swell	Severe: shrink-swell slope	Severe: low strength shrink-swell	Moderate: slope
Cromack	Moderate: slope too clayey depth to rock	Severe: shrink-swell	Severe: shrink-swell	Severe: shrink-swell slope	Severe: low strength shrink-swell	Moderate: slope depth to rock
139:						
Embry	Moderate: slope	Moderate: slope	Moderate: slope	Severe: slope	Moderate: slope	Moderate: slope
Orpha	Severe: cutbanks cave	Moderate: slope	Moderate: slope	Severe: slope	Moderate: slope	Moderate: slope droughty
140:						
Embry	Moderate: slope	Moderate: slope	Moderate: slope	Severe: slope	Moderate: slope	Moderate: slope
Taluce	Severe: depth to rock	Moderate: slope depth to rock	Severe: depth to rock	Severe: slope	Moderate: slope depth to rock	Severe: depth to rock
141:						
Emigha	Slight	Moderate: shrink-swell	Moderate: shrink-swell	Moderate: shrink-swell	Severe: low strength	Slight
142:						
Emigha, sodic	Moderate: too clayey	Severe: flooding	Severe: flooding	Severe: flooding	Severe: low strength	Slight
Arvada, thick surface	Moderate: too clayey	Severe: shrink-swell	Severe: shrink-swell	Severe: shrink-swell	Severe: low strength shrink-swell	Severe: excess sodium

Building Site Development--Continued

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
143:						
Felix, ponded	Severe: ponding	Severe: shrink-swell ponding	Severe: shrink-swell ponding	Severe: shrink-swell ponding	Severe: low strength shrink-swell ponding	Severe: too clayey ponding
144:						
Forkwood	Slight	Moderate: shrink-swell	Moderate: shrink-swell	Moderate: shrink-swell	Severe: low strength	Slight
145:						
Forkwood	Slight	Moderate: shrink-swell	Moderate: shrink-swell	Moderate: shrink-swell	Severe: low strength	Slight
Cambria	Slight	Moderate: shrink-swell	Slight	Moderate: shrink-swell	Moderate: low strength shrink-swell	Slight
146:						
Forkwood	Slight	Moderate: shrink-swell	Moderate: shrink-swell	Moderate: shrink-swell	Severe: low strength	Slight
Cushman	Moderate: depth to rock	Moderate: shrink-swell	Moderate: shrink-swell depth to rock	Moderate: shrink-swell	Severe: low strength	Moderate: depth to rock
147:						
Forkwood	Moderate: slope	Moderate: shrink-swell slope	Moderate: shrink-swell slope	Severe: slope	Severe: low strength	Moderate: slope
Cushman	Moderate: slope depth to rock	Moderate: shrink-swell slope	Moderate: shrink-swell slope depth to rock	Severe: slope	Severe: low strength	Moderate: slope depth to rock
148:						
Forkwood	Slight	Moderate: shrink-swell	Moderate: shrink-swell	Moderate: shrink-swell	Severe: low strength	Slight
Ulm	Moderate: too clayey	Moderate: shrink-swell	Moderate: shrink-swell	Moderate: shrink-swell	Severe: low strength	Slight
149:						
Forkwood	Moderate: slope	Moderate: shrink-swell slope	Moderate: shrink-swell slope	Severe: slope	Severe: low strength	Moderate: slope
Ulm	Moderate: slope	Moderate: shrink-swell slope	Moderate: shrink-swell slope	Severe: slope	Severe: low strength	Moderate: slope
150:						
Gateson	Severe: slope	Severe: slope	Severe: slope	Severe: slope	Severe: slope	Severe: slope
Taluce	Severe: slope depth to rock	Severe: slope	Severe: slope depth to rock	Severe: slope	Severe: slope	Severe: slope depth to rock
Turnercrest	Severe: slope	Severe: slope	Severe: slope	Severe: slope	Severe: slope	Severe: slope

Building Site Development--Continued

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
151:						
Haverdad	Moderate: flooding	Severe: flooding	Severe: flooding	Severe: flooding	Severe: flooding	Moderate: flooding
152:						
Haverdad	Moderate: flooding	Severe: flooding	Severe: flooding	Severe: flooding	Severe: flooding	Moderate: flooding
Clarkelen	Severe: cutbanks cave	Severe: flooding	Severe: flooding	Severe: flooding	Severe: flooding	Moderate: flooding
153:						
Haverdad	Moderate: flooding	Severe: flooding	Severe: flooding	Severe: flooding	Severe: flooding low strength	Moderate: flooding
Kishona	Slight	Moderate: shrink-swell	Moderate: shrink-swell	Moderate: shrink-swell	Severe: low strength	Slight
154:						
Heldt	Moderate: too clayey	Severe: shrink-swell	Severe: shrink-swell	Severe: shrink-swell	Severe: low strength shrink-swell	Slight
155:						
Heldt, saline	Moderate: too clayey	Severe: shrink-swell	Severe: shrink-swell	Severe: shrink-swell	Severe: low strength shrink-swell	Slight
Bidman, saline	Moderate: too clayey	Severe: shrink-swell	Severe: shrink-swell	Severe: shrink-swell	Severe: low strength shrink-swell	Slight
156:						
Hiland	Slight	Slight	Slight	Slight	Slight	Slight
157:						
Hiland	Slight	Slight	Slight	Slight	Slight	Slight
Bowbac	Moderate: depth to rock	Moderate: shrink-swell	Moderate: shrink-swell depth to rock	Moderate: shrink-swell	Moderate: low strength shrink-swell	Moderate: depth to rock
158:						
Hiland	Moderate: slope	Moderate: slope	Moderate: slope	Severe: slope	Moderate: slope	Moderate: slope
Bowbac	Moderate: slope depth to rock	Moderate: slope	Moderate: slope depth to rock	Severe: slope	Moderate: slope	Moderate: slope depth to rock
159:						
Hiland	Slight	Slight	Slight	Slight	Slight	Slight
Vonalee	Slight	Slight	Slight	Slight	Slight	Slight
160:						
Hiland	Moderate: slope	Moderate: slope	Moderate: slope	Severe: slope	Moderate: slope	Moderate: slope
Vonalee	Moderate: slope	Moderate: slope	Moderate: slope	Severe: slope	Moderate: slope	Moderate: slope

Building Site Development--Continued

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
161:						
Hilight	Severe: slope depth to rock	Severe: shrink-swell slope	Severe: shrink-swell slope depth to rock	Severe: shrink-swell slope	Severe: low strength shrink-swell slope	Severe: slope depth to rock
Taluce, cool	Severe: slope depth to rock	Severe: slope	Severe: slope depth to rock	Severe: slope	Severe: slope	Severe: slope depth to rock
Wags	Severe: slope	Severe: shrink-swell slope	Severe: shrink-swell slope	Severe: shrink-swell slope	Severe: low strength shrink-swell slope	Severe: slope too clayey
162:						
Lismas	Severe: slope depth to rock	Severe: shrink-swell slope	Severe: shrink-swell slope depth to rock	Severe: shrink-swell slope	Severe: low strength shrink-swell slope	Severe: slope depth to rock
Mittenbutte, cool	Severe: slope depth to rock	Severe: slope	Severe: slope depth to rock	Severe: slope	Severe: slope	Severe: slope depth to rock
Sabatka	Severe: slope	Severe: shrink-swell slope	Severe: shrink-swell slope	Severe: shrink-swell slope	Severe: low strength shrink-swell slope	Severe: slope too clayey
163:						
Hilight	Severe: slope depth to rock	Severe: shrink-swell slope	Severe: shrink-swell slope depth to rock	Severe: shrink-swell slope	Severe: low strength shrink-swell slope	Severe: slope too clayey depth to rock
Wags	Severe: slope	Severe: shrink-swell slope	Severe: shrink-swell slope	Severe: shrink-swell slope	Severe: low strength shrink-swell slope	Severe: slope
Badland	Severe: depth to rock	Moderate: depth to rock	Severe: depth to rock	Moderate: depth to rock	Moderate: depth to rock	Severe: depth to rock droughty
164:						
Lismas	Severe: slope depth to rock	Severe: shrink-swell slope	Severe: shrink-swell slope depth to rock	Severe: shrink-swell slope	Severe: low strength shrink-swell slope	Severe: slope too clayey depth to rock
Sabatka	Severe: slope	Severe: shrink-swell slope	Severe: shrink-swell slope	Severe: shrink-swell slope	Severe: low strength shrink-swell slope	Severe: slope
Badland	Severe: depth to rock	Moderate: depth to rock	Severe: depth to rock	Moderate: depth to rock	Moderate: depth to rock	Severe: depth to rock droughty

Building Site Development--Continued

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
165:						
Jayem----------------	Moderate: slope	Moderate: slope	Moderate: slope	Severe: slope	Moderate: slope	Moderate: slope
166:						
Jaywest--------------	Moderate: too clayey	Severe: shrink-swell	Moderate: shrink-swell	Severe: shrink-swell	Severe: low strength shrink-swell	Slight
167:						
Jaywest--------------	Moderate: too clayey	Moderate: shrink-swell	Moderate: shrink-swell	Moderate: shrink-swell	Severe: low strength	Slight
Moorhead-------------	Moderate: too clayey	Moderate: shrink-swell	Moderate: shrink-swell	Moderate: shrink-swell	Severe: low strength	Slight
168:						
Jaywest--------------	Moderate: too clayey	Moderate: shrink-swell	Moderate: shrink-swell	Moderate: shrink-swell	Severe: low strength	Slight
Spottedhorse---------	Moderate: too clayey depth to rock	Moderate: shrink-swell	Moderate: shrink-swell depth to rock	Moderate: shrink-swell	Severe: low strength	Moderate: depth to rock
169:						
Julesburg------------	Slight	Slight	Slight	Slight	Slight	Slight
170:						
Keeline--------------	Moderate: slope	Moderate: slope	Moderate: slope	Severe: slope	Moderate: slope	Moderate: slope droughty
Tullock--------------	Severe: slope cutbanks cave	Severe: slope	Severe: slope	Severe: slope	Severe: slope	Severe: slope
171:						
Keeline--------------	Moderate: slope	Moderate: slope	Moderate: slope	Severe: slope	Moderate: slope	Moderate: slope
Tullock--------------	Severe: slope cutbanks cave	Severe: slope	Severe: slope	Severe: slope	Severe: slope	Severe: slope
Niobrara, dry---------	Severe: slope depth to rock	Severe: slope	Severe: slope depth to rock	Severe: slope	Severe: slope	Severe: slope depth to rock
172:						
Keyner---------------	Slight	Slight	Slight	Slight	Slight	Severe: excess sodium
173:						
Lawver---------------	Moderate: too clayey	Moderate: shrink-swell	Slight	Moderate: shrink-swell	Moderate: shrink-swell	Slight
Teckla---------------	Severe: cutbanks cave	Slight	Slight	Slight	Slight	Slight
Wibaux---------------	Severe: large stones	Severe: large stones	Severe: large stones	Severe: large stones	Severe: large stones	Severe: small stones droughty

Building Site Development--Continued

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
174:						
Brislawn-------------	Moderate: too clayey	Moderate: shrink-swell	Slight	Moderate: shrink-swell	Moderate: shrink-swell	Slight
Rockybutte------------	Severe: cutbanks cave	Slight	Slight	Slight	Slight	Slight
Ironbutte-------------	Severe: large stones	Severe: large stones	Severe: large stones	Severe: large stones	Severe: large stones	Severe: small stones droughty
175:						
Lawver----------------	Moderate: slope too clayey	Moderate: shrink-swell slope	Moderate: slope	Severe: slope	Moderate: shrink-swell slope	Moderate: slope
Wibaux----------------	Severe: large stones slope	Severe: large stones slope	Severe: large stones slope	Severe: large stones slope	Severe: large stones slope	Severe: slope droughty
176:						
Leiter----------------	Moderate: too clayey depth to rock	Severe: shrink-swell	Severe: shrink-swell	Severe: shrink-swell	Severe: low strength shrink-swell	Moderate: depth to rock
Cromack---------------	Moderate: too clayey depth to rock	Severe: shrink-swell	Severe: shrink-swell	Severe: shrink-swell	Severe: low strength shrink-swell	Moderate: depth to rock
177:						
Maysdorf--------------	Slight	Moderate: shrink-swell	Slight	Moderate: shrink-swell	Moderate: shrink-swell	Slight
178:						
Maysdorf--------------	Slight	Moderate: shrink-swell	Slight	Moderate: shrink-swell	Moderate: shrink-swell	Slight
179:						
Maysdorf--------------	Slight	Slight	Slight	Slight	Slight	Slight
Pugsley---------------	Severe: cutbanks cave	Slight	Moderate: depth to rock	Slight	Slight	Moderate: depth to rock
180:						
Maysdorf--------------	Moderate: slope	Moderate: shrink-swell slope	Moderate: slope	Severe: slope	Moderate: shrink-swell slope	Moderate: slope
Pugsley---------------	Severe: cutbanks cave	Moderate: shrink-swell slope	Moderate: shrink-swell slope depth to rock	Severe: slope	Moderate: shrink-swell slope	Moderate: slope depth to rock
181:						
Moorhead--------------	Moderate: too clayey	Moderate: shrink-swell	Moderate: shrink-swell	Moderate: shrink-swell	Severe: low strength	Slight
182:						
Moorhead--------------	Moderate: too clayey	Moderate: shrink-swell	Moderate: shrink-swell	Moderate: shrink-swell	Severe: low strength	Slight

Building Site Development--Continued

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
183:						
Moorhead	Moderate: too clayey	Moderate: shrink-swell	Moderate: shrink-swell	Moderate: shrink-swell	Severe: low strength	Slight
Leiter	Moderate: too clayey depth to rock	Severe: shrink-swell	Severe: shrink-swell	Severe: shrink-swell	Severe: low strength shrink-swell	Moderate: depth to rock
184:						
Moorhead	Moderate: slope too clayey	Moderate: shrink-swell slope	Moderate: shrink-swell slope	Severe: slope	Severe: low strength	Moderate: slope
Leiter	Moderate: slope too clayey depth to rock	Severe: shrink-swell	Severe: shrink-swell	Severe: shrink-swell slope	Severe: low strength shrink-swell	Moderate: slope depth to rock
185:						
Moskee	Slight	Moderate: shrink-swell	Slight	Moderate: shrink-swell	Moderate: shrink-swell	Slight
186:						
Moskee	Moderate: slope	Moderate: slope	Moderate: slope	Severe: slope	Moderate: slope	Moderate: slope
187:						
Nuncho	Moderate: too clayey	Severe: shrink-swell	Moderate: shrink-swell	Severe: shrink-swell	Severe: low strength shrink-swell	Slight
188:						
Orpha	Severe: slope cutbanks cave	Severe: slope	Severe: slope	Severe: slope	Severe: slope	Severe: slope
Tullock	Severe: slope cutbanks cave	Severe: slope	Severe: slope	Severe: slope	Severe: slope	Severe: slope
189:						
Oshoto	Slight	Moderate: shrink-swell	Moderate: shrink-swell	Moderate: shrink-swell	Severe: low strength	Slight
Moorhead	Moderate: too clayey	Moderate: shrink-swell	Moderate: shrink-swell	Moderate: shrink-swell	Severe: low strength	Slight
190:						
Parmleed	Moderate: slope too clayey depth to rock	Severe: shrink-swell	Severe: shrink-swell	Severe: shrink-swell slope	Severe: low strength shrink-swell	Moderate: slope depth to rock
Renohill	Moderate: slope depth to rock	Moderate: shrink-swell slope	Moderate: shrink-swell slope depth to rock	Severe: slope	Severe: low strength	Moderate: slope depth to rock
191:						
Pits	---	---	---	---	---	---
Dumps	---	---	---	---	---	---

Building Site Development--Continued

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
192:						
Platmak---------------	Moderate: too clayey	Severe: shrink-swell	Moderate: shrink-swell	Severe: shrink-swell	Severe: low strength shrink-swell	Slight
193:						
Pugsley---------------	Severe: cutbanks cave	Slight	Moderate: depth to rock	Slight	Slight	Moderate: depth to rock
Decolney--------------	Slight	Slight	Slight	Slight	Slight	Slight
194:						
Pugsley---------------	Severe: cutbanks cave	Moderate: slope	Moderate: slope depth to rock	Severe: slope	Moderate: slope	Moderate: slope depth to rock
Decolney--------------	Moderate: slope	Moderate: slope	Moderate: slope	Severe: slope	Moderate: slope	Moderate: slope
195:						
Rauzi-----------------	Slight	Moderate: shrink-swell	Slight	Moderate: shrink-swell	Moderate: frost action shrink-swell	Slight
196:						
Rauzi-----------------	Slight	Moderate: shrink-swell	Moderate: shrink-swell	Moderate: shrink-swell	Moderate: frost action shrink-swell	Slight
197:						
Rauzi-----------------	Slight	Moderate: shrink-swell	Slight	Moderate: shrink-swell slope	Moderate: frost action shrink-swell	Slight
Elwop-----------------	Moderate: depth to rock	Slight	Moderate: depth to rock	Moderate: slope	Moderate: frost action	Moderate: depth to rock
198:						
Recluse---------------	Slight	Slight	Slight	Slight	Moderate: low strength	Slight
199:						
Renohill--------------	Moderate: too clayey depth to rock	Moderate: shrink-swell	Moderate: shrink-swell depth to rock	Moderate: shrink-swell	Severe: low strength	Moderate: depth to rock
Savageton-------------	Moderate: too clayey depth to rock	Severe: shrink-swell	Severe: shrink-swell	Severe: shrink-swell	Severe: low strength shrink-swell	Moderate: depth to rock
200:						
Renohill--------------	Moderate: slope too clayey depth to rock	Severe: shrink-swell	Severe: shrink-swell	Severe: shrink-swell slope	Severe: low strength shrink-swell	Moderate: slope depth to rock
Savageton-------------	Moderate: slope too clayey depth to rock	Severe: shrink-swell	Severe: shrink-swell	Severe: shrink-swell slope	Severe: low strength shrink-swell	Moderate: slope depth to rock

Building Site Development--Continued

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
201:						
Renohill	Moderate: depth to rock	Moderate: shrink-swell	Moderate: shrink-swell depth to rock	Moderate: shrink-swell slope	Severe: low strength	Moderate: depth to rock
Shingle	Severe: depth to rock	Moderate: shrink-swell slope depth to rock	Severe: depth to rock	Severe: slope	Severe: low strength	Severe: depth to rock
Worf	Severe: depth to rock	Moderate: shrink-swell slope depth to rock	Severe: depth to rock	Severe: slope	Moderate: low strength shrink-swell depth to rock	Severe: depth to rock
202:						
Renohill	Moderate: slope depth to rock	Moderate: shrink-swell slope	Moderate: shrink-swell slope depth to rock	Severe: slope	Severe: low strength	Moderate: slope depth to rock
Worfka	Severe: depth to rock	Moderate: shrink-swell slope depth to rock	Severe: depth to rock	Severe: slope	Severe: low strength	Severe: depth to rock
203:						
Rockypoint	Severe: cutbanks cave	Severe: flooding	Severe: flooding	Severe: flooding	Severe: flooding	Moderate: flooding
Iwait	Slight	Moderate: shrink-swell	Moderate: shrink-swell	Moderate: shrink-swell	Severe: low strength	Slight
204:						
Samday	Severe: slope depth to rock	Severe: shrink-swell slope	Severe: shrink-swell slope depth to rock	Severe: shrink-swell slope	Severe: low strength shrink-swell slope	Severe: slope depth to rock
Samday, cool	Severe: slope depth to rock	Severe: slope	Severe: slope depth to rock	Severe: slope	Severe: slope	Severe: slope depth to rock
Shingle	Severe: slope depth to rock	Severe: slope	Severe: slope depth to rock	Severe: slope	Severe: low strength slope	Severe: slope depth to rock
205:						
Samday	Severe: depth to rock	Severe: shrink-swell	Severe: shrink-swell depth to rock	Severe: shrink-swell slope	Severe: low strength shrink-swell	Severe: depth to rock
Savageton	Moderate: slope too clayey depth to rock	Severe: shrink-swell	Severe: shrink-swell	Severe: shrink-swell slope	Severe: low strength shrink-swell	Moderate: slope depth to rock
206:						
Samday	Severe: slope depth to rock	Severe: shrink-swell slope	Severe: shrink-swell slope depth to rock	Severe: shrink-swell slope	Severe: low strength shrink-swell slope	Severe: slope too clayey depth to rock

Building Site Development--Continued

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
206: (cont.)						
Shingle	Severe: slope depth to rock	Severe: slope	Severe: slope depth to rock	Severe: slope	Severe: low strength slope	Severe: slope depth to rock
Badland	Severe: depth to rock	Moderate: depth to rock	Severe: depth to rock	Moderate: depth to rock	Moderate: depth to rock	Severe: depth to rock droughty
207:						
Cromack	Moderate: slope too clayey depth to rock	Severe: shrink-swell	Severe: shrink-swell	Severe: shrink-swell slope	Severe: low strength shrink-swell	Moderate: slope depth to rock
Fairburn	Severe: depth to rock	Moderate: shrink-swell slope depth to rock	Severe: depth to rock	Severe: slope	Severe: low strength	Severe: depth to rock
Ucross	Moderate: slope depth to rock	Moderate: shrink-swell slope	Moderate: shrink-swell slope depth to rock	Severe: slope	Moderate: low strength shrink-swell slope	Moderate: slope depth to rock
208:						
Savageton	Moderate: too clayey depth to rock	Severe: shrink-swell	Severe: shrink-swell	Severe: shrink-swell	Severe: low strength shrink-swell	Moderate: depth to rock
Silhouette	Moderate: too clayey	Severe: shrink-swell	Severe: shrink-swell	Severe: shrink-swell	Severe: low strength shrink-swell	Slight
209:						
Savageton	Moderate: slope too clayey depth to rock	Severe: shrink-swell	Severe: shrink-swell	Severe: shrink-swell slope	Severe: low strength shrink-swell	Moderate: slope depth to rock
Silhouette	Moderate: slope too clayey	Severe: shrink-swell	Severe: shrink-swell	Severe: shrink-swell slope	Severe: low strength shrink-swell	Moderate: slope
210:						
Shingle	Severe: slope depth to rock	Severe: slope	Severe: slope depth to rock	Severe: slope	Severe: low strength slope	Severe: slope depth to rock
Taluce	Severe: slope depth to rock	Severe: slope	Severe: slope depth to rock	Severe: slope	Severe: slope	Severe: slope depth to rock
211:						
Shingle	Severe: slope depth to rock	Severe: slope	Severe: slope depth to rock	Severe: slope	Severe: low strength slope	Severe: slope depth to rock
Worf	Severe: slope depth to rock	Severe: slope	Severe: slope depth to rock	Severe: slope	Severe: slope	Severe: slope depth to rock

Building Site Development--Continued

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
212:						
Teckla----------------	Severe: cutbanks cave	Moderate: shrink-swell	Slight	Moderate: shrink-swell slope	Moderate: shrink-swell	Slight
213:						
Terro-----------------	Severe: slope cutbanks cave	Severe: slope	Severe: slope	Severe: slope	Severe: slope	Severe: slope
Taluce----------------	Severe: slope depth to rock	Severe: slope	Severe: slope depth to rock	Severe: slope	Severe: slope	Severe: slope depth to rock
214:						
Theedle---------------	Moderate: depth to rock	Moderate: shrink-swell	Moderate: shrink-swell depth to rock	Moderate: shrink-swell	Severe: low strength	Moderate: depth to rock
Kishona---------------	Slight	Moderate: shrink-swell	Moderate: shrink-swell	Moderate: shrink-swell	Severe: low strength	Slight
215:						
Theedle---------------	Moderate: slope depth to rock	Moderate: shrink-swell slope	Moderate: shrink-swell slope depth to rock	Severe: slope	Severe: low strength	Moderate: slope depth to rock
Kishona---------------	Moderate: slope	Moderate: shrink-swell slope	Moderate: shrink-swell slope	Severe: slope	Severe: low strength	Moderate: slope
216:						
Theedle---------------	Severe: slope	Severe: slope	Severe: slope	Severe: slope	Severe: low strength slope	Severe: slope
Kishona---------------	Moderate: slope	Moderate: shrink-swell slope	Moderate: shrink-swell slope	Severe: slope	Severe: low strength	Moderate: slope
Shingle---------------	Severe: slope depth to rock	Severe: slope	Severe: slope depth to rock	Severe: slope	Severe: low strength slope	Severe: slope depth to rock
217:						
Theedle---------------	Severe: slope	Severe: slope	Severe: slope	Severe: slope	Severe: low strength slope	Severe: slope
Shingle---------------	Severe: slope depth to rock	Severe: slope	Severe: slope depth to rock	Severe: slope	Severe: low strength slope	Severe: slope depth to rock
218:						
Theedle---------------	Moderate: slope depth to rock	Moderate: shrink-swell slope	Moderate: shrink-swell slope depth to rock	Severe: slope	Severe: low strength	Moderate: slope depth to rock

Building Site Development--Continued

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
218: (cont.)						
Turnercrest	Severe: cutbanks cave	Moderate: slope	Moderate: slope depth to rock	Severe: slope	Moderate: slope	Moderate: slope depth to rock
Kishona	Moderate: slope	Moderate: shrink-swell slope	Moderate: shrink-swell slope	Severe: slope	Severe: low strength	Moderate: slope
219:						
Torriarents	Moderate: slope	Moderate: shrink-swell slope	Moderate: shrink-swell slope	Severe: slope	Moderate: low strength shrink-swell slope	Moderate: slope
Torriorthents	Moderate: slope	Moderate: shrink-swell slope	Moderate: shrink-swell slope	Severe: slope	Moderate: low strength shrink-swell slope	Moderate: slope
220:						
Pitchdraw	Severe: slope cutbanks cave	Severe: slope	Severe: slope	Severe: slope	Severe: slope	Severe: slope
Ashollow	Moderate: slope	Moderate: slope	Moderate: slope	Severe: slope	Moderate: slope	Moderate: slope
Niobrara	Severe: slope depth to rock	Severe: slope	Severe: slope depth to rock	Severe: slope	Severe: slope	Severe: slope depth to rock
221:						
Turnercrest	Severe: slope	Severe: slope	Severe: slope	Severe: slope	Severe: slope	Severe: slope
Keeline	Moderate: slope	Moderate: slope	Moderate: slope	Severe: slope	Moderate: slope	Moderate: slope
Taluce	Severe: slope depth to rock	Severe: slope	Severe: slope depth to rock	Severe: slope	Severe: slope	Severe: slope depth to rock
222:						
Turnercrest	Severe: slope	Severe: slope	Severe: slope	Severe: slope	Severe: slope	Severe: slope
Wibaux, thin solum	Severe: large stones slope	Severe: large stones slope	Severe: large stones slope	Severe: large stones slope	Severe: large stones slope	Severe: slope small stones droughty
Taluce	Severe: slope depth to rock	Severe: slope	Severe: slope depth to rock	Severe: slope	Severe: slope	Severe: slope depth to rock
223:						
Ucross	Moderate: depth to rock	Moderate: shrink-swell	Moderate: shrink-swell depth to rock	Moderate: shrink-swell slope	Moderate: frost action low strength shrink-swell	Moderate: depth to rock

Building Site Development--Continued

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
224:						
Ucross	Moderate: depth to rock	Moderate: shrink-swell	Moderate: shrink-swell depth to rock	Moderate: shrink-swell	Moderate: frost action low strength shrink-swell	Moderate: depth to rock
Iwait	Slight	Moderate: shrink-swell	Moderate: shrink-swell	Moderate: shrink-swell	Severe: low strength	Slight
225:						
Ucross	Severe: slope	Severe: slope	Severe: slope	Severe: slope	Severe: slope	Severe: slope
Iwait	Moderate: slope	Moderate: shrink-swell slope	Moderate: shrink-swell slope	Severe: slope	Severe: low strength	Moderate: slope
Fairburn	Severe: slope depth to rock	Severe: slope	Severe: slope depth to rock	Severe: slope	Severe: low strength slope	Severe: slope depth to rock
226:						
Ulm	Moderate: too clayey	Moderate: shrink-swell	Moderate: shrink-swell	Moderate: shrink-swell	Severe: low strength	Slight
227:						
Ulm	Moderate: too clayey	Moderate: shrink-swell	Moderate: shrink-swell	Moderate: shrink-swell	Severe: low strength	Slight
228:						
Ulm	Moderate: too clayey	Moderate: shrink-swell	Moderate: shrink-swell	Moderate: shrink-swell	Severe: low strength	Slight
Renohill	Moderate: depth to rock	Moderate: shrink-swell	Moderate: shrink-swell depth to rock	Moderate: shrink-swell	Severe: low strength	Moderate: depth to rock
229:						
Ulm	Moderate: slope too clayey	Moderate: shrink-swell slope	Moderate: shrink-swell slope	Severe: slope	Severe: low strength	Moderate: slope
Renohill	Moderate: slope too clayey depth to rock	Moderate: shrink-swell slope	Moderate: shrink-swell slope depth to rock	Severe: slope	Severe: low strength	Moderate: slope depth to rock
230:						
Urban land	---	---	---	---	---	---
Deekay	Slight	Slight	Slight	Slight	Moderate: frost action low strength	Slight
Moorhead	Moderate: too clayey	Moderate: shrink-swell	Moderate: shrink-swell	Moderate: shrink-swell	Severe: low strength	Slight
231:						
Urban land	---	---	---	---	---	---

Building Site Development--Continued

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
231:(cont.)						
Leiter	Moderate: too clayey depth to rock	Severe: shrink-swell	Severe: shrink-swell	Severe: shrink-swell	Severe: low strength shrink-swell	Moderate: depth to rock
Moorhead	Moderate: too clayey	Moderate: shrink-swell	Moderate: shrink-swell	Moderate: shrink-swell slope	Severe: low strength	Slight
232:						
Urban land	---	---	---	---	---	---
Pitchdraw	Moderate: slope depth to rock	Moderate: slope	Moderate: slope depth to rock	Severe: slope	Moderate: slope	Moderate: slope depth to rock
Ashollow	Moderate: slope	Moderate: slope	Moderate: slope	Severe: slope	Moderate: slope	Moderate: slope
233:						
Ustic Torriorthents	---	---	---	---	---	---
234:						
Ustic Torriorthents	---	---	---	---	---	---
Badland	Severe: depth to rock	Moderate: depth to rock	Severe: depth to rock	Moderate: depth to rock	Moderate: depth to rock	Severe: depth to rock droughty
235:						
Vonalee	Slight	Slight	Slight	Moderate: slope	Slight	Slight
236:						
Vonalee	Slight	Slight	Slight	Moderate: slope	Slight	Slight
Terro	Severe: cutbanks cave	Slight	Moderate: depth to rock	Moderate: slope	Slight	Moderate: depth to rock droughty
237:						
Vonalf	Slight	Slight	Slight	Slight	Moderate: frost action	Slight
238:						
Vonalf	Slight	Slight	Slight	Moderate: slope	Moderate: frost action	Slight
Xema	Moderate: depth to rock	Slight	Moderate: depth to rock	Moderate: slope	Moderate: frost action	Moderate: depth to rock
239:						
Ironbutte	Severe: large stones slope	Severe: large stones slope	Severe: large stones slope	Severe: large stones slope	Severe: large stones slope	Severe: slope droughty
Fairburn	Severe: slope depth to rock	Severe: slope	Severe: slope depth to rock	Severe: slope	Severe: low strength slope	Severe: slope depth to rock

Building Site Development--Continued

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
239: (cont.)						
Mittenbutte----------	Severe: slope depth to rock	Severe: slope	Severe: slope depth to rock	Severe: slope	Severe: slope	Severe: slope depth to rock
240:						
Wibaux---------------	Severe: large stones slope	Severe: large stones slope	Severe: large stones slope	Severe: large stones slope	Severe: large stones slope	Severe: slope droughty
Wibaux, thin solum----	Severe: large stones slope	Severe: large stones slope	Severe: large stones slope	Severe: large stones slope	Severe: large stones slope	Severe: slope small stones droughty
241:						
Ironbutte------------	Severe: large stones slope	Severe: large stones slope	Severe: large stones slope	Severe: large stones slope	Severe: large stones slope	Severe: slope droughty
Ironbutte, thin solum-	Severe: large stones slope	Severe: large stones slope	Severe: large stones slope	Severe: large stones slope	Severe: large stones slope	Severe: slope small stones droughty
242:						
Ironbutte------------	Severe: large stones slope	Severe: large stones slope	Severe: large stones slope	Severe: large stones slope	Severe: large stones slope	Severe: slope small stones droughty
Deekay---------------	Moderate: slope	Moderate: shrink-swell slope	Moderate: slope	Severe: slope	Severe: low strength	Moderate: slope
Moorhead-------------	Moderate: slope too clayey	Moderate: shrink-swell slope	Moderate: shrink-swell slope	Severe: slope	Severe: low strength	Moderate: slope
243:						
Wibaux, thick solum---	Severe: slope cutbanks cave	Severe: slope	Severe: slope	Severe: slope	Severe: slope	Severe: slope
Wibaux---------------	Severe: large stones slope	Severe: large stones slope	Severe: large stones slope	Severe: large stones slope	Severe: large stones slope	Severe: slope droughty
244:						
Muleherder-----------	Severe: slope cutbanks cave	Severe: slope	Severe: slope	Severe: slope	Severe: slope	Severe: slope
Ironbutte------------	Severe: large stones slope	Severe: large stones slope	Severe: large stones slope	Severe: large stones slope	Severe: large stones slope	Severe: slope droughty
245:						
Wibaux---------------	Severe: large stones slope	Severe: large stones slope	Severe: large stones slope	Severe: large stones slope	Severe: large stones slope	Severe: slope droughty

Building Site Development--Continued

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
245: (cont.)						
Shingle	Severe: slope depth to rock	Severe: slope	Severe: slope depth to rock	Severe: slope	Severe: low strength slope	Severe: slope depth to rock
Badland	---	---	---	---	---	---
246:						
Wyarno	Slight	Moderate: shrink-swell	Moderate: shrink-swell	Moderate: shrink-swell	Severe: low strength	Slight
Ulm	Slight	Moderate: shrink-swell	Moderate: shrink-swell	Moderate: shrink-swell	Severe: low strength	Slight
247:						
Wyotite	Slight	Moderate: shrink-swell	Slight	Moderate: shrink-swell	Moderate: low strength shrink-swell	Slight
Ulm	Moderate: too clayey	Moderate: shrink-swell	Moderate: shrink-swell	Moderate: shrink-swell	Severe: low strength	Slight
248:						
Ziggy	Slight	Moderate: shrink-swell	Moderate: shrink-swell	Moderate: shrink-swell	Severe: low strength	Slight
Iwait	Slight	Moderate: shrink-swell	Moderate: shrink-swell	Moderate: shrink-swell	Severe: low strength	Slight
249:						
Ziggy	Slight	Moderate: shrink-swell	Moderate: shrink-swell	Moderate: shrink-swell	Severe: low strength	Slight
Iwait	Slight	Moderate: shrink-swell	Moderate: shrink-swell	Moderate: shrink-swell	Severe: low strength	Slight
250:						
Ziggy	Slight	Moderate: shrink-swell	Moderate: shrink-swell	Moderate: shrink-swell	Severe: low strength	Slight
Ucross	Moderate: depth to rock	Moderate: shrink-swell	Moderate: shrink-swell depth to rock	Moderate: shrink-swell slope	Severe: low strength	Moderate: depth to rock
Oldwolf	Moderate: depth to rock	Slight	Moderate: depth to rock	Moderate: slope	Moderate: frost action low strength	Moderate: depth to rock

Sanitary Facilities

(Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Dashes (--) indicate the map unit component was not rated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation.)

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
100:					
Aridic Ustorthents, saline	Moderate: percs slowly	Moderate: seepage slope	Slight	Slight	Good
101:					
Arvada, thick surface	Severe: percs slowly	Moderate: slope	Slight	Slight	Poor: hard to pack
102:					
Arvada, thick surface	Severe: percs slowly	Moderate: slope	Slight	Slight	Good
Arvada	Severe: percs slowly	Moderate: slope	Slight	Slight	Poor: hard to pack
Slickspots	---	---	---	---	---
103:					
Arwite	Slight	Severe: seepage	Slight	Slight	Good
104:					
Arwite	Moderate: slope	Severe: seepage slope	Moderate: slope	Moderate: slope	Fair: slope
105:					
Arwite	Slight	Severe: seepage	Slight	Slight	Good
Elwop	Severe: depth to rock	Severe: depth to rock	Severe: depth to rock	Slight	Poor: depth to rock
106:					
Arwite	Moderate: slope	Severe: seepage slope	Moderate: slope	Moderate: slope	Fair: slope
Elwop	Severe: depth to rock	Severe: slope depth to rock	Severe: depth to rock	Moderate: slope	Poor: depth to rock
107:					
Arwite	Slight	Severe: seepage	Slight	Slight	Good
Vonalf	Slight	Severe: seepage	Slight	Slight	Good
108:					
Arwite	Moderate: slope	Severe: seepage slope	Moderate: slope	Moderate: slope	Fair: slope

Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
108: (cont.)					
Vonalf	Moderate: slope	Severe: seepage slope	Moderate: slope	Moderate: slope	Fair: slope
109:					
Bidman	Severe: percs slowly	Moderate: seepage slope	Slight	Slight	Good
110:					
Bidman, loamy substratum	Severe: percs slowly	Moderate: seepage slope	Slight	Slight	Good
111:					
Bidman	Severe: percs slowly	Moderate: seepage slope	Slight	Slight	Good
Parmleed	Severe: percs slowly depth to rock	Severe: depth to rock	Severe: depth to rock	Slight	Poor: depth to rock
112:					
Bidman	Severe: percs slowly	Severe: slope	Moderate: slope	Moderate: slope	Fair: slope
Parmleed	Severe: depth to rock	Severe: slope depth to rock	Severe: depth to rock	Moderate: slope	Poor: depth to rock
113:					
Bidman	Severe: percs slowly	Moderate: seepage slope	Slight	Slight	Poor: hard to pack
Ulm	Severe: percs slowly	Moderate: slope	Slight	Slight	Good
114:					
Bowbac	Severe: depth to rock	Severe: seepage slope depth to rock	Severe: depth to rock	Moderate: slope	Poor: depth to rock
Taluce	Severe: depth to rock	Severe: seepage slope depth to rock	Severe: depth to rock	Moderate: slope	Poor: depth to rock
Badland	Severe: depth to rock	Severe: depth to rock	Severe: depth to rock	Severe: depth to rock	Poor: depth to rock
115:					
Bowbac	Severe: depth to rock	Severe: seepage slope depth to rock	Severe: depth to rock	Moderate: slope	Poor: depth to rock

Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
115: (cont.)					
Worf	Severe: depth to rock	Severe: slope depth to rock	Severe: depth to rock	Moderate: slope	Poor: depth to rock
116:					
Cambria	Moderate: percs slowly	Moderate: seepage slope	Slight	Slight	Good
Kishona	Moderate: percs slowly	Moderate: seepage slope	Slight	Slight	Good
Zigweid	Moderate: percs slowly	Moderate: seepage slope	Slight	Slight	Good
117:					
Cambria	Moderate: percs slowly slope	Severe: slope	Moderate: slope	Moderate: slope	Fair: slope
Kishona	Moderate: percs slowly slope	Severe: slope	Moderate: slope	Moderate: slope	Fair: slope
Zigweid	Moderate: percs slowly slope	Severe: slope	Moderate: slope	Moderate: slope	Fair: slope
118:					
Clarkelen	Severe: flooding	Severe: flooding seepage	Severe: flooding	Severe: flooding	Fair: too sandy
Draknab	Severe: flooding poor filter	Severe: flooding seepage	Severe: flooding too sandy	Severe: flooding	Poor: seepage too sandy
119:					
Clarkelen	Severe: flooding	Severe: flooding seepage	Severe: flooding	Severe: flooding	Fair: too sandy
Embry	Slight	Severe: seepage	Slight	Slight	Good
120:					
Clarkelen	Severe: flooding	Severe: flooding seepage	Severe: flooding	Severe: flooding	Fair: too sandy
Keeline	Slight	Severe: seepage	Slight	Slight	Good
121:					
Cushman	Severe: depth to rock	Severe: depth to rock	Severe: depth to rock	Slight	Poor: depth to rock

Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
121: (cont.)					
Cambria----------------	Moderate: percs slowly	Moderate: seepage slope	Slight	Slight	Good
122:					
Cushman----------------	Severe: depth to rock	Severe: slope depth to rock	Severe: depth to rock	Moderate: slope	Poor: depth to rock
Cambria----------------	Moderate: percs slowly slope	Severe: slope	Moderate: slope	Moderate: slope	Fair: slope
123:					
Cushman----------------	Severe: depth to rock	Severe: slope depth to rock	Severe: depth to rock	Moderate: slope	Poor: depth to rock
Renohill---------------	Severe: percs slowly depth to rock	Severe: slope depth to rock	Severe: depth to rock	Moderate: slope	Poor: depth to rock
124:					
Cushman----------------	Severe: depth to rock	Severe: slope depth to rock	Severe: depth to rock	Moderate: slope	Poor: depth to rock
Shingle----------------	Severe: depth to rock	Severe: slope depth to rock	Severe: depth to rock	Moderate: slope	Poor: depth to rock
125:					
Cushman----------------	Severe: depth to rock	Severe: slope depth to rock	Severe: depth to rock	Moderate: slope	Poor: depth to rock
Terro------------------	Severe: poor filter depth to rock	Severe: seepage slope depth to rock	Severe: depth to rock	Moderate: slope	Poor: depth to rock
126:					
Cushman----------------	Severe: depth to rock	Severe: depth to rock	Severe: depth to rock	Slight	Poor: depth to rock
Theedle----------------	Severe: depth to rock	Severe: depth to rock	Severe: depth to rock	Slight	Poor: depth to rock
127:					
Cushman----------------	Severe: depth to rock	Severe: slope depth to rock	Severe: depth to rock	Moderate: slope	Poor: depth to rock
Theedle----------------	Severe: depth to rock	Severe: slope depth to rock	Severe: depth to rock	Moderate: slope	Poor: depth to rock
128:					
Cushman----------------	Severe: depth to rock	Severe: slope depth to rock	Severe: depth to rock	Moderate: slope	Poor: depth to rock

Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
128: (cont.)					
Worf	Severe: depth to rock	Severe: slope depth to rock	Severe: depth to rock	Moderate: slope	Poor: depth to rock
129:					
Decolney	Slight	Severe: seepage	Slight	Slight	Good
Hiland	Slight	Severe: seepage	Slight	Slight	Good
130:					
Decolney	Moderate: slope	Severe: seepage slope	Moderate: slope	Moderate: slope	Fair: slope
Hiland	Moderate: percs slowly slope	Severe: seepage slope	Moderate: slope	Moderate: slope	Fair: slope
131:					
Deekay	Moderate: percs slowly	Moderate: seepage slope	Slight	Slight	Good
132:					
Deekay	Moderate: percs slowly	Moderate: seepage slope	Slight	Slight	Good
Moorhead	Severe: percs slowly	Moderate: slope	Slight	Slight	Good
133:					
Deekay	Moderate: percs slowly slope	Severe: slope	Moderate: slope	Moderate: slope	Fair: slope
Moorhead	Severe: percs slowly	Severe: slope	Moderate: slope	Moderate: slope	Fair: slope
134:					
Deekay	Moderate: percs slowly	Moderate: seepage slope	Slight	Slight	Good
Oldwolf	Severe: depth to rock	Severe: depth to rock	Severe: depth to rock	Slight	Poor: depth to rock
135:					
Deekay	Moderate: percs slowly slope	Severe: slope	Moderate: slope	Moderate: slope	Fair: slope
Oldwolf	Severe: depth to rock	Severe: slope depth to rock	Severe: depth to rock	Moderate: slope	Poor: depth to rock

Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
136:					
Deekay	Moderate: percs slowly	Moderate: seepage slope	Slight	Slight	Good
Ziggy	Moderate: percs slowly	Moderate: seepage slope	Slight	Slight	Good
137:					
Echeta	Severe: percs slowly	Moderate: slope	Slight	Slight	Poor: hard to pack
138:					
Echeta	Severe: percs slowly	Severe: slope	Moderate: slope	Moderate: slope	Poor: hard to pack
Cromack	Severe: percs slowly depth to rock	Severe: slope depth to rock	Severe: depth to rock	Moderate: slope	Poor: hard to pack depth to rock
139:					
Embry	Moderate: slope	Severe: seepage slope	Moderate: slope	Moderate: slope	Fair: slope
Orpha	Severe: poor filter	Severe: seepage slope	Severe: too sandy	Moderate: slope	Poor: seepage too sandy
140:					
Embry	Moderate: slope	Severe: seepage slope	Moderate: slope	Moderate: slope	Fair: slope
Taluce	Severe: depth to rock	Severe: seepage slope depth to rock	Severe: depth to rock	Moderate: slope	Poor: depth to rock
141:					
Emigha	Moderate: percs slowly	Moderate: seepage	Slight	Slight	Good
142:					
Emigha, sodic	Severe: percs slowly	Moderate: slope	Moderate: flooding	Moderate: flooding	Good
Arvada, thick surface	Severe: percs slowly	Moderate: slope	Slight	Slight	Poor: hard to pack
143:					
Felix, ponded	Severe: percs slowly ponding	Severe: ponding	Severe: ponding	Severe: ponding	Poor: hard to pack ponding
144:					
Forkwood	Moderate: percs slowly	Moderate: seepage slope	Slight	Slight	Good

Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
145:					
Forkwood	Moderate: percs slowly	Moderate: seepage slope	Slight	Slight	Good
Cambria	Moderate: percs slowly	Moderate: seepage slope	Slight	Slight	Good
146:					
Forkwood	Moderate: percs slowly	Moderate: seepage slope	Slight	Slight	Good
Cushman	Severe: depth to rock	Severe: depth to rock	Severe: depth to rock	Slight	Poor: depth to rock
147:					
Forkwood	Moderate: percs slowly slope	Severe: slope	Moderate: slope	Moderate: slope	Fair: slope
Cushman	Severe: depth to rock	Severe: slope depth to rock	Severe: depth to rock	Moderate: slope	Poor: depth to rock
148:					
Forkwood	Moderate: percs slowly	Moderate: seepage slope	Slight	Slight	Good
Ulm	Severe: percs slowly	Moderate: slope	Slight	Slight	Good
149:					
Forkwood	Moderate: percs slowly slope	Severe: slope	Moderate: slope	Moderate: slope	Fair: slope
Ulm	Severe: percs slowly	Severe: slope	Moderate: slope	Moderate: slope	Fair: slope
150:					
Gateson	Severe: slope depth to rock	Severe: slope depth to rock	Severe: slope depth to rock	Severe: slope depth to rock	Poor: slope depth to rock
Taluce	Severe: slope depth to rock	Severe: seepage slope depth to rock	Severe: slope depth to rock	Severe: slope	Poor: slope depth to rock
Turnercrest	Severe: slope depth to rock	Severe: seepage slope depth to rock	Severe: slope depth to rock	Severe: slope	Poor: slope depth to rock
151:					
Haverdad	Severe: flooding	Severe: flooding	Severe: flooding	Severe: flooding	Good

Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
152:					
Haverdad	Severe: flooding	Severe: flooding	Severe: flooding	Severe: flooding	Good
Clarkelen	Severe: flooding	Severe: flooding seepage	Severe: flooding	Severe: flooding	Fair: too sandy
153:					
Haverdad	Severe: flooding	Severe: flooding	Severe: flooding	Severe: flooding	Good
Kishona	Moderate: percs slowly	Moderate: seepage slope	Slight	Slight	Good
154:					
Heldt	Severe: percs slowly	Moderate: slope	Slight	Slight	Good
155:					
Heldt, saline	Severe: percs slowly	Slight	Slight	Slight	Poor: hard to pack
Bidman, saline	Severe: percs slowly	Slight	Slight	Slight	Good
156:					
Hiland	Slight	Severe: seepage	Slight	Slight	Good
157:					
Hiland	Slight	Severe: seepage	Slight	Slight	Good
Bowbac	Severe: depth to rock	Severe: seepage depth to rock	Severe: depth to rock	Slight	Poor: depth to rock
158:					
Hiland	Moderate: slope	Severe: seepage slope	Moderate: slope	Moderate: slope	Fair: slope
Bowbac	Severe: depth to rock	Severe: seepage slope depth to rock	Severe: depth to rock	Moderate: slope	Poor: depth to rock
159:					
Hiland	Slight	Severe: seepage	Slight	Slight	Good
Vonalee	Slight	Severe: seepage	Slight	Slight	Good
160:					
Hiland	Moderate: slope	Severe: seepage slope	Moderate: slope	Moderate: slope	Fair: slope

Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
160: (cont.)					
Vonalee	Moderate: slope	Severe: seepage slope	Moderate: slope	Moderate: slope	Fair: slope
161:					
Hilight	Severe: slope depth to rock	Severe: slope depth to rock	Severe: slope depth to rock	Severe: slope	Poor: hard to pack slope depth to rock
Taluce, cool	Severe: slope depth to rock	Severe: seepage slope depth to rock	Severe: slope depth to rock	Severe: slope	Poor: slope depth to rock
Wags	Severe: percs slowly slope depth to rock	Severe: slope depth to rock	Severe: slope depth to rock	Severe: slope	Poor: hard to pack slope depth to rock
162:					
Lismas	Severe: slope depth to rock	Severe: slope depth to rock	Severe: slope depth to rock	Severe: slope	Poor: hard to pack slope depth to rock
Mittenbutte, cool	Severe: slope depth to rock	Severe: seepage slope depth to rock	Severe: slope depth to rock	Severe: slope	Poor: slope depth to rock
Sabatka	Severe: percs slowly slope depth to rock	Severe: slope depth to rock	Severe: slope depth to rock	Severe: slope	Poor: hard to pack slope depth to rock
163:					
Hilight	Severe: slope depth to rock	Severe: slope depth to rock	Severe: slope depth to rock	Severe: slope	Poor: hard to pack slope depth to rock
Wags	Severe: slope depth to rock	Severe: slope depth to rock	Severe: slope depth to rock	Severe: slope	Poor: hard to pack slope depth to rock
Badland	Severe: depth to rock	Severe: depth to rock	Severe: depth to rock	Severe: depth to rock	Poor: depth to rock
164:					
Lismas	Severe: slope depth to rock	Severe: slope depth to rock	Severe: slope depth to rock	Severe: slope	Poor: hard to pack slope depth to rock
Sabatka	Severe: slope depth to rock	Severe: slope depth to rock	Severe: slope depth to rock	Severe: slope	Poor: hard to pack slope depth to rock

Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
164:(cont.)					
Badland	Severe: depth to rock	Severe: depth to rock	Severe: depth to rock	Severe: depth to rock	Poor: depth to rock
165:					
Jayem	Moderate: slope	Severe: seepage slope	Moderate: slope	Moderate: slope	Fair: slope
166:					
Jaywest	Severe: percs slowly	Moderate: slope	Slight	Slight	Good
167:					
Jaywest	Severe: percs slowly	Moderate: slope	Slight	Slight	Good
Moorhead	Severe: percs slowly	Moderate: slope	Slight	Slight	Good
168:					
Jaywest	Severe: percs slowly	Moderate: slope	Slight	Slight	Good
Spottedhorse	Severe: percs slowly depth to rock	Severe: depth to rock	Severe: depth to rock	Slight	Poor: depth to rock
169:					
Julesburg	Slight	Severe: seepage	Slight	Slight	Good
170:					
Keeline	Moderate: slope	Severe: seepage slope	Moderate: slope	Moderate: slope	Fair: slope
Tullock	Severe: slope poor filter depth to rock	Severe: seepage slope depth to rock	Severe: slope too sandy depth to rock	Severe: slope	Poor: seepage too sandy depth to rock
171:					
Keeline	Moderate: slope	Severe: seepage slope	Moderate: slope	Moderate: slope	Fair: slope
Tullock	Severe: slope depth to rock	Severe: seepage slope depth to rock	Severe: slope too sandy depth to rock	Severe: slope	Poor: seepage too sandy depth to rock
Niobrara, dry	Severe: slope depth to rock	Severe: slope depth to rock	Severe: slope too sandy depth to rock	Severe: slope	Poor: seepage too sandy depth to rock
172:					
Keyner	Severe: percs slowly	Moderate: slope	Slight	Slight	Good

Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
173:					
Lawver	Severe: percs slowly poor filter	Severe: seepage	Slight	Slight	Poor: seepage small stones
Teckla	Moderate: percs slowly	Severe: seepage	Slight	Slight	Poor: small stones
Wibaux	Severe: large stones poor filter	Severe: large stones seepage	Severe: large stones	Slight	Poor: seepage small stones
174:					
Brislawn	Severe: percs slowly poor filter	Severe: seepage	Slight	Slight	Poor: seepage small stones
Rockybutte	Moderate: percs slowly	Severe: seepage	Slight	Slight	Poor: small stones
Ironbutte	Severe: large stones poor filter	Severe: large stones seepage	Severe: large stones	Slight	Poor: seepage small stones
175:					
Lawver	Severe: percs slowly poor filter	Severe: seepage slope	Moderate: slope	Moderate: slope	Poor: seepage small stones
Wibaux	Severe: large stones slope poor filter	Severe: large stones seepage slope	Severe: large stones slope	Severe: slope	Poor: seepage slope small stones
176:					
Leiter	Severe: percs slowly depth to rock	Severe: depth to rock	Severe: depth to rock	Slight	Poor: depth to rock
Cromack	Severe: percs slowly depth to rock	Severe: depth to rock	Severe: depth to rock	Slight	Poor: hard to pack depth to rock
177:					
Maysdorf	Moderate: percs slowly	Severe: seepage	Slight	Slight	Good
178:					
Maysdorf	Moderate: percs slowly	Severe: seepage	Slight	Slight	Good
179:					
Maysdorf	Slight	Severe: seepage	Slight	Slight	Good
Pugsley	Severe: depth to rock	Severe: seepage depth to rock	Severe: depth to rock	Slight	Poor: depth to rock

Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
180:					
Maysdorf	Moderate: percs slowly slope	Severe: seepage slope	Moderate: slope	Moderate: slope	Fair: slope
Pugsley	Severe: poor filter depth to rock	Severe: seepage slope depth to rock	Severe: depth to rock	Moderate: slope	Poor: depth to rock
181:					
Moorhead	Severe: percs slowly	Moderate: slope	Slight	Slight	Good
182:					
Moorhead	Severe: percs slowly	Moderate: slope	Slight	Slight	Good
183:					
Moorhead	Severe: percs slowly	Moderate: slope	Slight	Slight	Good
Leiter	Severe: percs slowly depth to rock	Severe: depth to rock	Severe: depth to rock	Slight	Poor: depth to rock
184:					
Moorhead	Severe: percs slowly	Severe: slope	Moderate: slope	Moderate: slope	Fair: slope
Leiter	Severe: percs slowly depth to rock	Severe: slope depth to rock	Severe: depth to rock	Moderate: slope	Poor: depth to rock
185:					
Moskee	Moderate: percs slowly	Severe: seepage	Slight	Slight	Good
186:					
Moskee	Moderate: percs slowly slope	Severe: seepage slope	Moderate: slope	Moderate: slope	Fair: slope
187:					
Nuncho	Severe: percs slowly	Moderate: slope	Slight	Slight	Good
188:					
Orpha	Severe: slope poor filter	Severe: seepage slope	Severe: slope too sandy	Severe: slope	Poor: seepage slope too sandy
Tullock	Severe: slope poor filter depth to rock	Severe: seepage slope depth to rock	Severe: slope too sandy depth to rock	Severe: slope	Poor: seepage too sandy depth to rock
189:					
Oshoto	Moderate: percs slowly	Moderate: seepage slope	Slight	Slight	Good

Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
189: (cont.)					
Moorhead	Severe: percs slowly	Moderate: slope	Slight	Slight	Good
190:					
Parmleed	Severe: percs slowly depth to rock	Severe: slope depth to rock	Severe: depth to rock	Moderate: slope	Poor: hard to pack depth to rock
Renohill	Severe: percs slowly depth to rock	Severe: slope depth to rock	Severe: depth to rock	Moderate: slope	Poor: depth to rock
191:					
Pits	---	---	---	---	---
Dumps	---	---	---	---	---
192:					
Platmak	Severe: percs slowly	Moderate: slope	Slight	Slight	Good
193:					
Pugsley	Severe: poor filter depth to rock	Severe: seepage depth to rock	Severe: depth to rock	Slight	Poor: depth to rock
Decolney	Slight	Severe: seepage	Slight	Slight	Good
194:					
Pugsley	Severe: poor filter depth to rock	Severe: seepage slope depth to rock	Severe: depth to rock	Moderate: slope	Poor: depth to rock
Decolney	Moderate: slope	Severe: seepage slope	Moderate: slope	Moderate: slope	Fair: slope
195:					
Rauzi	Moderate: percs slowly	Severe: seepage	Slight	Slight	Good
196:					
Rauzi	Moderate: percs slowly	Severe: seepage	Slight	Slight	Good
197:					
Rauzi	Moderate: percs slowly	Severe: seepage	Slight	Slight	Good
Elwop	Severe: depth to rock	Severe: depth to rock	Severe: depth to rock	Slight	Poor: depth to rock
198:					
Recluse	Moderate: percs slowly	Moderate: seepage slope	Slight	Slight	Good

Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
199:					
Renohill	Severe: percs slowly depth to rock	Severe: depth to rock	Severe: depth to rock	Slight	Poor: depth to rock
Savageton	Severe: percs slowly depth to rock	Severe: depth to rock	Severe: depth to rock	Slight	Poor: hard to pack depth to rock
200:					
Renohill	Severe: percs slowly depth to rock	Severe: slope depth to rock	Severe: depth to rock	Moderate: slope	Poor: hard to pack depth to rock
Savageton	Severe: percs slowly depth to rock	Severe: slope depth to rock	Severe: depth to rock	Moderate: slope	Poor: hard to pack depth to rock
201:					
Renohill	Severe: percs slowly depth to rock	Severe: depth to rock	Severe: depth to rock	Slight	Poor: depth to rock
Shingle	Severe: depth to rock	Severe: slope depth to rock	Severe: depth to rock	Moderate: slope	Poor: depth to rock
Worf	Severe: depth to rock	Severe: slope depth to rock	Severe: depth to rock	Moderate: slope	Poor: depth to rock
202:					
Renohill	Severe: percs slowly depth to rock	Severe: slope depth to rock	Severe: depth to rock	Moderate: slope	Poor: depth to rock
Worfka	Severe: depth to rock	Severe: slope depth to rock	Severe: depth to rock	Moderate: slope	Poor: depth to rock
203:					
Rockypoint	Severe: flooding	Severe: flooding	Severe: flooding	Severe: flooding	Fair: too sandy
Iwait	Moderate: percs slowly	Moderate: seepage slope	Slight	Slight	Good
204:					
Samday	Severe: slope depth to rock	Severe: slope depth to rock	Severe: slope depth to rock	Severe: slope	Poor: hard to pack slope depth to rock
Samday, cool	Severe: slope depth to rock	Severe: slope depth to rock	Severe: slope depth to rock	Severe: slope	Poor: slope depth to rock
Shingle	Severe: slope depth to rock	Severe: slope depth to rock	Severe: slope depth to rock	Severe: slope	Poor: slope depth to rock

Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
205:					
Samday	Severe: depth to rock	Severe: slope depth to rock	Severe: depth to rock	Moderate: slope	Poor: hard to pack depth to rock
Savageton	Severe: percs slowly depth to rock	Severe: slope depth to rock	Severe: depth to rock	Moderate: slope	Poor: hard to pack depth to rock
206:					
Samday	Severe: slope depth to rock	Severe: slope depth to rock	Severe: slope depth to rock	Severe: slope	Poor: hard to pack slope depth to rock
Shingle	Severe: slope depth to rock	Severe: slope depth to rock	Severe: slope depth to rock	Severe: slope	Poor: slope depth to rock
Badland	Severe: depth to rock	Severe: depth to rock	Severe: depth to rock	Severe: depth to rock	Poor: depth to rock
207:					
Cromack	Severe: percs slowly depth to rock	Severe: slope depth to rock	Severe: depth to rock	Moderate: slope	Poor: hard to pack depth to rock
Fairburn	Severe: depth to rock	Severe: slope depth to rock	Severe: depth to rock	Moderate: slope	Poor: depth to rock
Ucross	Severe: depth to rock	Severe: slope depth to rock	Severe: depth to rock	Moderate: slope	Poor: depth to rock
208:					
Savageton	Severe: percs slowly depth to rock	Severe: depth to rock	Severe: depth to rock	Slight	Poor: hard to pack depth to rock
Silhouette	Severe: percs slowly	Moderate: slope	Slight	Slight	Good
209:					
Savageton	Severe: percs slowly depth to rock	Severe: slope depth to rock	Severe: depth to rock	Moderate: slope	Poor: hard to pack depth to rock
Silhouette	Severe: percs slowly	Severe: slope	Moderate: slope	Moderate: slope	Fair: slope
210:					
Shingle	Severe: slope depth to rock	Severe: slope depth to rock	Severe: slope depth to rock	Severe: slope	Poor: slope depth to rock
Taluce	Severe: slope depth to rock	Severe: seepage slope depth to rock	Severe: slope depth to rock	Severe: slope	Poor: slope depth to rock

Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
211:					
Shingle	Severe: slope depth to rock	Severe: slope depth to rock	Severe: slope depth to rock	Severe: slope	Poor: slope depth to rock
Worf	Severe: slope depth to rock	Severe: slope depth to rock	Severe: slope depth to rock	Severe: slope	Poor: slope depth to rock
212:					
Teckla	Moderate: percs slowly	Severe: seepage	Moderate: too sandy	Slight	Poor: seepage small stones
213:					
Terro	Severe: slope poor filter depth to rock	Severe: seepage slope depth to rock	Severe: slope depth to rock	Severe: slope	Poor: slope depth to rock
Taluce	Severe: slope depth to rock	Severe: seepage slope depth to rock	Severe: slope depth to rock	Severe: slope	Poor: slope depth to rock
214:					
Theedle	Severe: depth to rock	Severe: depth to rock	Severe: depth to rock	Slight	Poor: depth to rock
Kishona	Moderate: percs slowly	Moderate: seepage slope	Slight	Slight	Good
215:					
Theedle	Severe: depth to rock	Severe: slope depth to rock	Severe: depth to rock	Moderate: slope	Poor: depth to rock
Kishona	Moderate: percs slowly slope	Severe: slope	Moderate: slope	Moderate: slope	Fair: slope
216:					
Theedle	Severe: slope depth to rock	Severe: slope depth to rock	Severe: slope depth to rock	Severe: slope	Poor: slope depth to rock
Kishona	Moderate: percs slowly slope	Severe: slope	Moderate: slope	Moderate: slope	Fair: slope
Shingle	Severe: slope depth to rock	Severe: slope depth to rock	Severe: slope depth to rock	Severe: slope	Poor: slope depth to rock
217:					
Theedle	Severe: slope depth to rock	Severe: slope depth to rock	Severe: slope depth to rock	Severe: slope	Poor: slope depth to rock

Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
217:(cont.)					
Shingle	Severe: slope depth to rock	Severe: slope depth to rock	Severe: slope depth to rock	Severe: slope	Poor: slope depth to rock
218:					
Theedle	Severe: depth to rock	Severe: slope depth to rock	Severe: depth to rock	Moderate: slope	Poor: depth to rock
Turnercrest	Severe: poor filter depth to rock	Severe: seepage slope depth to rock	Severe: depth to rock	Moderate: slope	Poor: depth to rock
Kishona	Moderate: percs slowly slope	Severe: slope	Moderate: slope	Moderate: slope	Fair: slope
219:					
Torriarents	Moderate: slope	Severe: slope	Moderate: slope	Moderate: slope	Fair: slope small stones
Torriorthents	Moderate: slope	Severe: slope	Moderate: slope	Moderate: slope	Fair: slope small stones
220:					
Pitchdraw	Severe: slope poor filter depth to rock	Severe: seepage slope depth to rock	Severe: slope depth to rock	Severe: slope	Poor: slope depth to rock
Ashollow	Moderate: slope	Severe: seepage slope	Moderate: slope	Moderate: slope	Fair: slope
Niobrara	Severe: slope depth to rock	Severe: seepage slope depth to rock	Severe: slope too sandy depth to rock	Severe: slope	Poor: seepage too sandy depth to rock
221:					
Turnercrest	Severe: slope depth to rock	Severe: seepage slope depth to rock	Severe: slope depth to rock	Severe: slope	Poor: slope depth to rock
Keeline	Moderate: slope	Severe: seepage slope	Moderate: slope	Moderate: slope	Fair: slope
Taluce	Severe: slope depth to rock	Severe: seepage slope depth to rock	Severe: slope depth to rock	Severe: slope	Poor: slope depth to rock

Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
222:					
Turnercrest	Severe: slope depth to rock	Severe: seepage slope depth to rock	Severe: slope depth to rock	Severe: slope	Poor: slope depth to rock
Wibaux, thin solum	Severe: large stones slope poor filter	Severe: large stones seepage slope	Severe: large stones slope	Severe: slope	Poor: seepage slope small stones
Taluce	Severe: slope depth to rock	Severe: seepage slope depth to rock	Severe: slope depth to rock	Severe: slope	Poor: slope depth to rock
223:					
Ucross	Severe: depth to rock	Severe: depth to rock	Severe: depth to rock	Slight	Poor: depth to rock
224:					
Ucross	Severe: depth to rock	Severe: depth to rock	Severe: depth to rock	Slight	Poor: depth to rock
Iwait	Moderate: percs slowly	Moderate: seepage slope	Slight	Slight	Good
225:					
Ucross	Severe: slope depth to rock	Severe: slope depth to rock	Severe: slope depth to rock	Severe: slope	Poor: slope depth to rock
Iwait	Moderate: percs slowly slope	Severe: slope	Moderate: slope	Moderate: slope	Fair: slope
Fairburn	Severe: slope depth to rock	Severe: slope depth to rock	Severe: slope depth to rock	Severe: slope	Poor: slope depth to rock
226:					
Ulm	Severe: percs slowly	Moderate: slope	Slight	Slight	Good
227:					
Ulm	Severe: percs slowly	Moderate: slope	Slight	Slight	Good
228:					
Ulm	Severe: percs slowly	Moderate: slope	Slight	Slight	Good
Renohill	Severe: percs slowly depth to rock	Severe: depth to rock	Severe: depth to rock	Slight	Poor: depth to rock
229:					
Ulm	Severe: percs slowly	Severe: slope	Moderate: slope	Moderate: slope	Fair: slope

Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
229: (cont.)					
Renohill	Severe: percs slowly depth to rock	Severe: slope depth to rock	Severe: depth to rock	Moderate: slope	Poor: depth to rock
230:					
Urban land	---	---	---	---	---
Deekay	Moderate: percs slowly	Moderate: seepage slope	Slight	Slight	Good
Moorhead	Severe: percs slowly	Moderate: slope	Slight	Slight	Good
231:					
Urban land	---	---	---	---	---
Leiter	Severe: percs slowly depth to rock	Severe: depth to rock	Severe: depth to rock	Slight	Poor: depth to rock
Moorhead	Severe: percs slowly	Moderate: slope	Slight	Slight	Good
232:					
Urban land	---	---	---	---	---
Pitchdraw	Severe: depth to rock	Severe: seepage slope depth to rock	Severe: depth to rock	Moderate: slope	Poor: depth to rock
Ashollow	Moderate: slope	Severe: seepage slope	Moderate: slope	Moderate: slope	Fair: slope
233:					
Ustic Torriorthents	---	---	---	---	---
234:					
Ustic Torriorthents	---	---	---	---	---
Badland	Severe: depth to rock	Severe: depth to rock	Severe: depth to rock	Severe: depth to rock	Poor: depth to rock
235:					
Vonalee	Slight	Severe: seepage	Slight	Slight	Good
236:					
Vonalee	Slight	Severe: seepage	Slight	Slight	Good
Terro	Severe: poor filter depth to rock	Severe: seepage depth to rock	Severe: depth to rock	Slight	Poor: depth to rock
237:					
Vonalf	Slight	Severe: seepage	Slight	Slight	Good

Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
238:					
Vonalf	Slight	Severe: seepage	Slight	Slight	Good
Xema	Severe: depth to rock	Severe: seepage depth to rock	Severe: depth to rock	Slight	Poor: depth to rock
239:					
Ironbutte	Severe: large stones slope poor filter	Severe: large stones seepage slope	Severe: large stones slope	Severe: slope	Poor: seepage slope small stones
Fairburn	Severe: slope depth to rock	Severe: slope depth to rock	Severe: slope depth to rock	Severe: slope	Poor: slope depth to rock
Mittenbutte	Severe: slope depth to rock	Severe: seepage slope depth to rock	Severe: slope depth to rock	Severe: slope	Poor: slope depth to rock
240:					
Wibaux	Severe: large stones slope poor filter	Severe: large stones seepage slope	Severe: large stones slope	Severe: slope	Poor: seepage slope small stones
Wibaux, thin solum	Severe: large stones slope poor filter	Severe: large stones seepage slope	Severe: large stones slope	Severe: slope	Poor: seepage slope small stones
241:					
Ironbutte	Severe: large stones slope poor filter	Severe: large stones seepage slope	Severe: large stones slope	Severe: slope	Poor: seepage slope small stones
Ironbutte, thin solum	Severe: large stones slope poor filter	Severe: large stones seepage slope	Severe: large stones slope	Severe: slope	Poor: seepage slope small stones
242:					
Ironbutte	Severe: large stones slope poor filter	Severe: large stones seepage slope	Severe: large stones slope	Severe: slope	Poor: seepage slope small stones
Deekay	Moderate: percs slowly slope	Severe: slope	Moderate: slope	Moderate: slope	Fair: slope
Moorhead	Severe: percs slowly	Severe: slope	Moderate: slope	Moderate: slope	Fair: slope

Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
243:					
Wibaux, thick solum----	Severe: slope poor filter	Severe: seepage slope	Severe: large stones slope	Severe: slope	Poor: seepage slope small stones
Wibaux-----------------	Severe: large stones slope poor filter	Severe: seepage slope	Severe: large stones slope	Severe: slope	Poor: seepage slope small stones
244:					
Muleherder-------------	Severe: slope poor filter	Severe: seepage slope	Severe: large stones slope	Severe: slope	Poor: seepage slope small stones
Ironbutte--------------	Severe: large stones slope poor filter	Severe: large stones seepage slope	Severe: large stones slope	Severe: slope	Poor: seepage slope small stones
245:					
Wibaux-----------------	Severe: large stones slope poor filter	Severe: large stones seepage slope	Severe: large stones slope	Severe: slope	Poor: seepage slope small stones
Shingle----------------	Severe: slope depth to rock	Severe: slope depth to rock	Severe: slope depth to rock	Severe: slope	Poor: slope depth to rock
Badland----------------	---	---	---	---	---
246:					
Wyarno-----------------	Severe: percs slowly	Moderate: slope	Slight	Slight	Good
Ulm--------------------	Severe: percs slowly	Moderate: slope	Slight	Slight	Good
247:					
Wyotite----------------	Moderate: percs slowly	Moderate: seepage slope	Slight	Slight	Good
Ulm--------------------	Severe: percs slowly	Moderate: slope	Slight	Slight	Good
248:					
Ziggy------------------	Moderate: percs slowly	Moderate: seepage slope	Slight	Slight	Good
Iwait------------------	Moderate: percs slowly	Moderate: seepage slope	Slight	Slight	Good
249:					
Ziggy------------------	Moderate: percs slowly	Moderate: seepage slope	Slight	Slight	Good

Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
249: (cont.)					
Iwait	Moderate: percs slowly	Moderate: seepage slope	Slight	Slight	Good
250:					
Ziggy	Moderate: percs slowly	Moderate: seepage slope	Slight	Slight	Good
Ucross	Severe: depth to rock	Severe: slope depth to rock	Severe: depth to rock	Slight	Poor: depth to rock
Oldwolf	Severe: depth to rock	Severe: slope depth to rock	Severe: depth to rock	Slight	Poor: depth to rock

Construction Materials

(Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "good," "fair," or other terms. Dashes (--) indicate the map unit component was not rated.) The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation.

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
100:				
Aridic Ustorthents, saline	Fair:	Improbable:	Improbable:	Poor:
	low strength	excess fines	excess fines	excess salt
	shrink-swell			too clayey
101:				
Arvada, thick surface	Poor:	Improbable:	Improbable:	Poor:
	low strength	excess fines	excess fines	excess sodium
	shrink-swell			excess salt
				too clayey
102:				
Arvada, thick surface	Poor:	Improbable:	Improbable:	Poor:
	low strength	excess fines	excess fines	excess sodium
	shrink-swell			excess salt
				too clayey
Arvada	Poor:	Improbable:	Improbable:	Poor:
	low strength	excess fines	excess fines	excess sodium
	shrink-swell			excess salt
				too clayey
Slickspots	---	---	---	---
103:				
Arwite	Good	Improbable:	Improbable:	Fair:
		excess fines	excess fines	small stones
104:				
Arwite	Good	Improbable:	Improbable:	Fair:
		excess fines	excess fines	slope
				small stones
				too clayey
105:				
Arwite	Good	Improbable:	Improbable:	Fair:
		excess fines	excess fines	small stones
				too clayey
Elwop	Poor:	Improbable:	Improbable:	Fair:
	depth to rock	excess fines	excess fines	thin layer
				too clayey
				depth to rock
106:				
Arwite	Good	Improbable:	Improbable:	Fair:
		excess fines	excess fines	slope
				small stones
				too clayey
Elwop	Poor:	Improbable:	Improbable:	Fair:
	depth to rock	excess fines	excess fines	thin layer
				too clayey
				depth to rock

Construction Materials--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
107:				
Arwite	Good	Improbable: excess fines	Improbable: excess fines	Fair: too clayey
Vonalf	Good	Improbable: excess fines	Improbable: excess fines	Good
108:				
Arwite	Good	Improbable: excess fines	Improbable: excess fines	Fair: slope too clayey
Vonalf	Good	Improbable: excess fines	Improbable: excess fines	Fair: slope
109:				
Bidman	Fair: low strength shrink-swell	Improbable: excess fines	Improbable: excess fines	Poor: thin layer
110:				
Bidman, loamy substratum	Fair: shrink-swell	Improbable: excess fines	Improbable: excess fines	Poor: too clayey
111:				
Bidman	Poor: low strength	Improbable: excess fines	Improbable: excess fines	Poor: too clayey
Parmleed	Poor: low strength depth to rock	Improbable: excess fines	Improbable: excess fines	Poor: too clayey
112:				
Bidman	Poor: low strength	Improbable: excess fines	Improbable: excess fines	Poor: too clayey
Parmleed	Poor: low strength depth to rock	Improbable: excess fines	Improbable: excess fines	Poor: too clayey
113:				
Bidman	Fair: low strength shrink-swell	Improbable: excess fines	Improbable: excess fines	Poor: too clayey
Ulm	Poor: low strength	Improbable: excess fines	Improbable: excess fines	Poor: too clayey
114:				
Bowbac	Poor: depth to rock	Improbable: excess fines	Improbable: excess fines	Fair: small stones thin layer depth to rock
Taluce	Poor: depth to rock	Improbable: excess fines	Improbable: excess fines	Poor: depth to rock
Badland	Poor: depth to rock	Improbable: excess fines	Improbable: excess fines	Poor: depth to rock

Construction Materials--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
115:				
Bowbac	Poor: depth to rock	Improbable: excess fines	Improbable: excess fines	Fair: small stones thin layer depth to rock
Worf	Poor: depth to rock	Improbable: excess fines	Improbable: excess fines	Poor: depth to rock
116:				
Cambria	Fair: low strength shrink-swell	Improbable: excess fines	Improbable: excess fines	Fair: small stones too clayey
Kishona	Poor: low strength	Improbable: excess fines	Improbable: excess fines	Fair: small stones too clayey
Zigweid	Poor: low strength	Improbable: excess fines	Improbable: excess fines	Fair: small stones too clayey
117:				
Cambria	Fair: low strength shrink-swell	Improbable: excess fines	Improbable: excess fines	Fair: slope small stones too clayey
Kishona	Poor: low strength	Improbable: excess fines	Improbable: excess fines	Fair: slope small stones too clayey
Zigweid	Poor: low strength	Improbable: excess fines	Improbable: excess fines	Fair: slope small stones too clayey
118:				
Clarkelen	Good	Improbable: excess fines	Improbable: excess fines	Fair: too sandy
Draknab	Good	Probable	Improbable: too sandy	Fair: small stones thin layer too sandy
119:				
Clarkelen	Good	Improbable: excess fines	Improbable: excess fines	Fair: small stones too sandy
Embry	Good	Improbable: excess fines	Improbable: excess fines	Good
120:				
Clarkelen	Good	Improbable: excess fines	Improbable: excess fines	Fair: too sandy
Keeline	Good	Improbable: excess fines	Improbable: excess fines	Good

Construction Materials--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
121:				
Cushman-----------------	Poor: low strength depth to rock	Improbable: excess fines	Improbable: excess fines	Fair: thin layer too clayey depth to rock
Cambria-----------------	Fair: low strength shrink-swell	Improbable: excess fines	Improbable: excess fines	Fair: small stones too clayey
122:				
Cushman-----------------	Poor: low strength depth to rock	Improbable: excess fines	Improbable: excess fines	Fair: thin layer too clayey depth to rock
Cambria-----------------	Fair: low strength shrink-swell	Improbable: excess fines	Improbable: excess fines	Fair: slope small stones too clayey
123:				
Cushman-----------------	Poor: low strength depth to rock	Improbable: excess fines	Improbable: excess fines	Fair: thin layer too clayey depth to rock
Renohill----------------	Poor: low strength depth to rock	Improbable: excess fines	Improbable: excess fines	Poor: too clayey
124:				
Cushman-----------------	Poor: low strength depth to rock	Improbable: excess fines	Improbable: excess fines	Fair: thin layer too clayey depth to rock
Shingle-----------------	Poor: low strength depth to rock	Improbable: excess fines	Improbable: excess fines	Poor: depth to rock
125:				
Cushman-----------------	Poor: low strength depth to rock	Improbable: excess fines	Improbable: excess fines	Fair: thin layer too clayey depth to rock
Terro-------------------	Poor: depth to rock	Improbable: excess fines	Improbable: excess fines	Fair: small stones too sandy depth to rock
126:				
Cushman-----------------	Poor: low strength depth to rock	Improbable: excess fines	Improbable: excess fines	Fair: thin layer too clayey depth to rock
Theedle-----------------	Poor: low strength depth to rock	Improbable: excess fines	Improbable: excess fines	Fair: small stones too clayey depth to rock

Construction Materials--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
127:				
Cushman	Poor: low strength depth to rock	Improbable: excess fines	Improbable: excess fines	Fair: thin layer too clayey depth to rock
Theedle	Poor: low strength depth to rock	Improbable: excess fines	Improbable: excess fines	Fair: small stones too clayey depth to rock
128:				
Cushman	Poor: low strength depth to rock	Improbable: excess fines	Improbable: excess fines	Fair: thin layer too clayey depth to rock
Worf	Poor: depth to rock	Improbable: excess fines	Improbable: excess fines	Poor: depth to rock
129:				
Decolney	Good	Improbable: excess fines	Improbable: excess fines	Good
Hiland	Good	Improbable: excess fines	Improbable: excess fines	Good
130:				
Decolney	Good	Improbable: excess fines	Improbable: excess fines	Fair: slope
Hiland	Good	Improbable: excess fines	Improbable: excess fines	Fair: slope too clayey
131:				
Deekay	Fair: low strength	Improbable: excess fines	Improbable: excess fines	Fair: small stones too clayey
132:				
Deekay	Fair: low strength	Improbable: excess fines	Improbable: excess fines	Fair: small stones too clayey
Moorhead	Poor: low strength	Improbable: excess fines	Improbable: excess fines	Poor: too clayey
133:				
Deekay	Fair: low strength	Improbable: excess fines	Improbable: excess fines	Fair: slope small stones too clayey
Moorhead	Poor: low strength	Improbable: excess fines	Improbable: excess fines	Poor: too clayey
134:				
Deekay	Fair: low strength	Improbable: excess fines	Improbable: excess fines	Fair: small stones too clayey

Construction Materials--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
134:(cont.)				
Oldwolf	Poor: depth to rock	Improbable: excess fines	Improbable: excess fines	Fair: small stones too clayey depth to rock
135:				
Deekay	Fair: low strength	Improbable: excess fines	Improbable: excess fines	Fair: slope small stones too clayey
Oldwolf	Poor: depth to rock	Improbable: excess fines	Improbable: excess fines	Fair: small stones too clayey depth to rock
136:				
Deekay	Fair: low strength	Improbable: excess fines	Improbable: excess fines	Fair: small stones too clayey
Ziggy	Poor: low strength	Improbable: excess fines	Improbable: excess fines	Fair: small stones too clayey
137:				
Echeta	Poor: low strength shrink-swell	Improbable: excess fines	Improbable: excess fines	Poor: too clayey
138:				
Echeta	Poor: low strength shrink-swell	Improbable: excess fines	Improbable: excess fines	Poor: too clayey
Cromack	Poor: low strength shrink-swell depth to rock	Improbable: excess fines	Improbable: excess fines	Poor: too clayey
139:				
Embry	Good	Improbable: excess fines	Improbable: excess fines	Fair: slope
Orpha	Good	Probable	Improbable: too sandy	Poor: too sandy
140:				
Embry	Good	Improbable: excess fines	Improbable: excess fines	Fair: slope
Taluce	Poor: depth to rock	Improbable: excess fines	Improbable: excess fines	Poor: depth to rock
141:				
Emigha	Poor: low strength	Improbable: excess fines	Improbable: excess fines	Fair: too clayey
142:				
Emigha, sodic	Poor: low strength	Improbable: excess fines	Improbable: excess fines	Poor: too clayey

Construction Materials--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
142: (cont.)				
Arvada, thick surface	Poor: low strength shrink-swell	Improbable: excess fines	Improbable: excess fines	Poor: excess sodium excess salt too clayey
143:				
Felix, ponded	Poor: low strength shrink-swell wetness	Improbable: excess fines	Improbable: excess fines	Poor: too clayey wetness
144:				
Forkwood	Poor: low strength	Improbable: excess fines	Improbable: excess fines	Fair: too clayey
145:				
Forkwood	Poor: low strength	Improbable: excess fines	Improbable: excess fines	Fair: too clayey
Cambria	Good	Improbable: excess fines	Improbable: excess fines	Fair: small stones too clayey
146:				
Forkwood	Poor: low strength	Improbable: excess fines	Improbable: excess fines	Fair: too clayey
Cushman	Poor: low strength depth to rock	Improbable: excess fines	Improbable: excess fines	Fair: thin layer too clayey depth to rock
147:				
Forkwood	Poor: low strength	Improbable: excess fines	Improbable: excess fines	Fair: slope too clayey
Cushman	Poor: low strength depth to rock	Improbable: excess fines	Improbable: excess fines	Fair: thin layer too clayey depth to rock
148:				
Forkwood	Poor: low strength	Improbable: excess fines	Improbable: excess fines	Fair: too clayey
Ulm	Poor: low strength	Improbable: excess fines	Improbable: excess fines	Poor: thin layer
149:				
Forkwood	Poor: low strength	Improbable: excess fines	Improbable: excess fines	Fair: slope too clayey
Ulm	Poor: low strength	Improbable: excess fines	Improbable: excess fines	Poor: thin layer
150:				
Gateson	Poor: depth to rock	Improbable: excess fines	Improbable: excess fines	Poor: slope

Construction Materials--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
150: (cont.)				
Taluce------------------	Poor: depth to rock	Improbable: excess fines	Improbable: excess fines	Poor: slope depth to rock
Turnercrest-------------	Poor: depth to rock	Improbable: excess fines	Improbable: excess fines	Poor: slope
151:				
Haverdad----------------	Fair: low strength shrink-swell	Improbable: excess fines	Improbable: excess fines	Fair: too clayey
152:				
Haverdad----------------	Fair: low strength shrink-swell	Improbable: excess fines	Improbable: excess fines	Fair: too clayey
Clarkelen---------------	Good	Improbable: excess fines	Improbable: excess fines	Fair: too sandy
153:				
Haverdad----------------	Poor: low strength	Improbable: excess fines	Improbable: excess fines	Fair: too clayey
Kishona-----------------	Poor: low strength	Improbable: excess fines	Improbable: excess fines	Fair: small stones too clayey
154:				
Heldt-------------------	Poor: low strength shrink-swell	Improbable: excess fines	Improbable: excess fines	Poor: too clayey
155:				
Heldt, saline-----------	Poor: low strength shrink-swell	Improbable: excess fines	Improbable: excess fines	Poor: excess salt too clayey
Bidman, saline----------	Poor: low strength shrink-swell	Improbable: excess fines	Improbable: excess fines	Poor: excess salt too clayey
156:				
Hiland------------------	Good	Improbable: excess fines	Improbable: excess fines	Good
157:				
Hiland------------------	Good	Improbable: excess fines	Improbable: excess fines	Good
Bowbac------------------	Poor: depth to rock	Improbable: excess fines	Improbable: excess fines	Fair: small stones too clayey depth to rock
158:				
Hiland------------------	Good	Improbable: excess fines	Improbable: excess fines	Fair: slope

Construction Materials--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
158:(cont.)				
Bowbac	Poor: depth to rock	Improbable: excess fines	Improbable: excess fines	Fair: small stones thin layer depth to rock
159:				
Hiland	Good	Improbable: excess fines	Improbable: excess fines	Fair: too clayey
Vonalee	Good	Improbable: excess fines	Improbable: excess fines	Good
160:				
Hiland	Good	Improbable: excess fines	Improbable: excess fines	Fair: slope too clayey
Vonalee	Good	Improbable: excess fines	Improbable: excess fines	Fair: slope
161:				
Hilight	Poor: low strength shrink-swell depth to rock	Improbable: excess fines	Improbable: excess fines	Poor: slope too clayey depth to rock
Taluce, cool	Poor: depth to rock	Improbable: excess fines	Improbable: excess fines	Poor: slope depth to rock
Wags	Poor: low strength shrink-swell depth to rock	Improbable: excess fines	Improbable: excess fines	Poor: slope too clayey
162:				
Lismas	Poor: low strength shrink-swell depth to rock	Improbable: excess fines	Improbable: excess fines	Poor: slope too clayey depth to rock
Mittenbutte, cool	Poor: depth to rock	Improbable: excess fines	Improbable: excess fines	Poor: slope depth to rock
Sabatka	Poor: low strength shrink-swell depth to rock	Improbable: excess fines	Improbable: excess fines	Poor: slope too clayey
163:				
Hilight	Poor: low strength shrink-swell depth to rock	Improbable: excess fines	Improbable: excess fines	Poor: slope too clayey depth to rock
Wags	Poor: low strength shrink-swell depth to rock	Improbable: excess fines	Improbable: excess fines	Poor: slope too clayey

Construction Materials--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
163: (cont.)				
Badland	Poor: depth to rock	Improbable: excess fines	Improbable: excess fines	Poor: depth to rock
164:				
Lismas	Poor: low strength shrink-swell depth to rock	Improbable: excess fines	Improbable: excess fines	Poor: slope too clayey depth to rock
Sabatka	Poor: low strength shrink-swell depth to rock	Improbable: excess fines	Improbable: excess fines	Poor: slope too clayey
Badland	Poor: depth to rock	Improbable: excess fines	Improbable: excess fines	Poor: depth to rock
165:				
Jayem	Good	Improbable: excess fines	Improbable: excess fines	Fair: slope
166:				
Jaywest	Poor: low strength	Improbable: excess fines	Improbable: excess fines	Poor: too clayey
167:				
Jaywest	Poor: low strength	Improbable: excess fines	Improbable: excess fines	Poor: too clayey
Moorhead	Poor: low strength	Improbable: excess fines	Improbable: excess fines	Poor: too clayey
168:				
Jaywest	Poor: low strength	Improbable: excess fines	Improbable: excess fines	Poor: too clayey
Spottedhorse	Poor: low strength depth to rock	Improbable: excess fines	Improbable: excess fines	Poor: thin layer
169:				
Julesburg	Good	Improbable: excess fines	Improbable: excess fines	Good
170:				
Keeline	Good	Improbable: excess fines	Improbable: excess fines	Fair: slope
Tullock	Poor: depth to rock	Improbable: thin layer	Improbable: too sandy	Poor: slope too sandy
171:				
Keeline	Good	Improbable: excess fines	Improbable: excess fines	Fair: slope
Tullock	Poor: depth to rock	Improbable: thin layer	Improbable: too sandy	Poor: slope too sandy

Construction Materials--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
171: (cont.)				
Niobrara, dry	Poor: depth to rock	Improbable: thin layer	Improbable: too sandy	Poor: slope too sandy depth to rock
172:				
Keyner	Good	Improbable: excess fines	Improbable: excess fines	Poor: excess sodium excess salt
173:				
Lawver	Good	Probable	Probable	Poor: area reclaim small stones too clayey
Teckla	Good	Probable	Probable	Poor: area reclaim small stones
Wibaux	Poor: large stones	Improbable: large stones small stones	Improbable: large stones	Poor: area reclaim small stones
174:				
Brislawn	Good	Probable	Probable	Poor: area reclaim small stones too clayey
Rockybutte	Good	Probable	Probable	Poor: area reclaim small stones
Ironbutte	Poor: large stones	Improbable: large stones small stones	Improbable: large stones	Poor: area reclaim small stones
175:				
Lawver	Good	Probable	Probable	Poor: area reclaim small stones too clayey
Wibaux	Poor: large stones	Improbable: large stones small stones	Improbable: large stones	Poor: area reclaim slope small stones
176:				
Leiter	Poor: low strength shrink-swell depth to rock	Improbable: excess fines	Improbable: excess fines	Poor: too clayey
Cromack	Poor: low strength shrink-swell depth to rock	Improbable: excess fines	Improbable: excess fines	Poor: too clayey

Construction Materials--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
177:				
Maysdorf----------------	Good	Improbable: excess fines	Improbable: excess fines	Fair: small stones too clayey
178:				
Maysdorf----------------	Good	Improbable: excess fines	Improbable: excess fines	Fair: small stones too clayey
179:				
Maysdorf----------------	Good	Improbable: excess fines	Improbable: excess fines	Fair: small stones too clayey
Pugsley-----------------	Poor: depth to rock	Improbable: excess fines	Improbable: excess fines	Fair: small stones too clayey depth to rock
180:				
Maysdorf----------------	Good	Improbable: excess fines	Improbable: excess fines	Fair: slope small stones too clayey
Pugsley-----------------	Poor: depth to rock	Improbable: excess fines	Improbable: excess fines	Fair: small stones too clayey depth to rock
181:				
Moorhead----------------	Poor: low strength	Improbable: excess fines	Improbable: excess fines	Poor: too clayey
182:				
Moorhead----------------	Poor: low strength	Improbable: excess fines	Improbable: excess fines	Poor: too clayey
183:				
Moorhead----------------	Poor: low strength	Improbable: excess fines	Improbable: excess fines	Poor: too clayey
Leiter------------------	Poor: low strength shrink-swell depth to rock	Improbable: excess fines	Improbable: excess fines	Poor: too clayey
184:				
Moorhead----------------	Poor: low strength	Improbable: excess fines	Improbable: excess fines	Poor: too clayey
Leiter------------------	Poor: low strength shrink-swell depth to rock	Improbable: excess fines	Improbable: excess fines	Poor: too clayey
185:				
Moskee------------------	Good	Improbable: excess fines	Improbable: excess fines	Fair: too clayey

Construction Materials--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
186:				
Moskee	Good	Improbable: excess fines	Improbable: excess fines	Fair: slope
187:				
Nuncho	Poor: low strength	Improbable: excess fines	Improbable: excess fines	Poor: too clayey
188:				
Orpha	Fair: slope	Probable	Improbable: too sandy	Poor: slope too sandy
Tullock	Poor: depth to rock	Improbable: thin layer	Improbable: too sandy	Poor: slope too sandy
189:				
Oshoto	Poor: low strength	Improbable: excess fines	Improbable: excess fines	Fair: too clayey
Moorhead	Poor: low strength	Improbable: excess fines	Improbable: excess fines	Poor: too clayey
190:				
Parmleed	Poor: low strength shrink-swell depth to rock	Improbable: excess fines	Improbable: excess fines	Poor: too clayey
Renohill	Poor: low strength depth to rock	Improbable: excess fines	Improbable: excess fines	Poor: too clayey
191:				
Pits	---	---	---	---
Dumps	---	---	---	---
192:				
Platmak	Poor: low strength	Improbable: excess fines	Improbable: excess fines	Poor: too clayey
193:				
Pugsley	Poor: depth to rock	Improbable: excess fines	Improbable: excess fines	Fair: small stones too sandy depth to rock
Decolney	Good	Improbable: excess fines	Improbable: excess fines	Good
194:				
Pugsley	Poor: depth to rock	Improbable: excess fines	Improbable: excess fines	Fair: small stones too sandy depth to rock
Decolney	Good	Improbable: excess fines	Improbable: excess fines	Fair: slope

Construction Materials--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
195:				
Rauzi	Good	Improbable: excess fines	Improbable: excess fines	Fair: too clayey
196:				
Rauzi	Good	Improbable: excess fines	Improbable: excess fines	Fair: too clayey
197:				
Rauzi	Good	Improbable: excess fines	Improbable: excess fines	Fair: too clayey
Elwop	Poor: depth to rock	Improbable: excess fines	Improbable: excess fines	Fair: thin layer too clayey depth to rock
198:				
Recluse	Fair: low strength	Improbable: excess fines	Improbable: excess fines	Fair: small stones too clayey
199:				
Renohill	Poor: low strength depth to rock	Improbable: excess fines	Improbable: excess fines	Poor: too clayey
Savageton	Poor: low strength shrink-swell depth to rock	Improbable: excess fines	Improbable: excess fines	Poor: too clayey
200:				
Renohill	Poor: low strength shrink-swell depth to rock	Improbable: excess fines	Improbable: excess fines	Poor: too clayey
Savageton	Poor: low strength shrink-swell depth to rock	Improbable: excess fines	Improbable: excess fines	Poor: too clayey
201:				
Renohill	Poor: low strength depth to rock	Improbable: excess fines	Improbable: excess fines	Poor: too clayey
Shingle	Poor: low strength depth to rock	Improbable: excess fines	Improbable: excess fines	Poor: depth to rock
Worf	Poor: depth to rock	Improbable: excess fines	Improbable: excess fines	Poor: depth to rock
202:				
Renohill	Poor: low strength depth to rock	Improbable: excess fines	Improbable: excess fines	Poor: too clayey
Worfka	Poor: low strength depth to rock	Improbable: excess fines	Improbable: excess fines	Poor: too clayey depth to rock

Construction Materials--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
203:				
Rockypoint	Good	Improbable: excess fines	Improbable: excess fines	Fair: small stones too clayey
Iwait	Poor: low strength	Improbable: excess fines	Improbable: excess fines	Fair: small stones too clayey
204:				
Samday	Poor: low strength shrink-swell depth to rock	Improbable: excess fines	Improbable: excess fines	Poor: slope too clayey depth to rock
Samday, cool	Poor: depth to rock	Improbable: excess fines	Improbable: excess fines	Poor: slope too clayey depth to rock
Shingle	Poor: low strength depth to rock	Improbable: excess fines	Improbable: excess fines	Poor: slope depth to rock
205:				
Samday	Poor: low strength shrink-swell depth to rock	Improbable: excess fines	Improbable: excess fines	Poor: too clayey depth to rock
Savageton	Poor: low strength shrink-swell depth to rock	Improbable: excess fines	Improbable: excess fines	Poor: too clayey
206:				
Samday	Poor: low strength shrink-swell depth to rock	Improbable: excess fines	Improbable: excess fines	Poor: slope too clayey depth to rock
Shingle	Poor: low strength slope depth to rock	Improbable: excess fines	Improbable: excess fines	Poor: slope depth to rock
Badland	Poor: depth to rock	Improbable: excess fines	Improbable: excess fines	Poor: depth to rock
207:				
Cromack	Poor: low strength shrink-swell depth to rock	Improbable: excess fines	Improbable: excess fines	Poor: too clayey
Fairburn	Poor: low strength depth to rock	Improbable: excess fines	Improbable: excess fines	Poor: depth to rock
Ucross	Poor: depth to rock	Improbable: excess fines	Improbable: excess fines	Fair: small stones too clayey depth to rock

Construction Materials--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
208:				
Savageton	Poor: low strength shrink-swell depth to rock	Improbable: excess fines	Improbable: excess fines	Poor: too clayey
Silhouette	Poor: low strength shrink-swell	Improbable: excess fines	Improbable: excess fines	Poor: too clayey
209:				
Savageton	Poor: low strength shrink-swell depth to rock	Improbable: excess fines	Improbable: excess fines	Poor: too clayey
Silhouette	Poor: low strength shrink-swell	Improbable: excess fines	Improbable: excess fines	Poor: too clayey
210:				
Shingle	Poor: low strength depth to rock	Improbable: excess fines	Improbable: excess fines	Poor: slope depth to rock
Taluce	Poor: depth to rock	Improbable: excess fines	Improbable: excess fines	Poor: slope depth to rock
211:				
Shingle	Poor: low strength depth to rock	Improbable: excess fines	Improbable: excess fines	Poor: slope depth to rock
Worf	Poor: depth to rock	Improbable: excess fines	Improbable: excess fines	Poor: slope depth to rock
212:				
Teckla	Good	Probable	Probable	Poor: area reclaim small stones
213:				
Terro	Poor: depth to rock	Improbable: excess fines	Improbable: excess fines	Poor: slope
Taluce	Poor: depth to rock	Improbable: excess fines	Improbable: excess fines	Poor: slope depth to rock
214:				
Theedle	Poor: low strength depth to rock	Improbable: excess fines	Improbable: excess fines	Fair: small stones too clayey depth to rock
Kishona	Poor: low strength	Improbable: excess fines	Improbable: excess fines	Fair: small stones too clayey

Construction Materials--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
215:				
Theedle-----------------	Poor: low strength depth to rock	Improbable: excess fines	Improbable: excess fines	Fair: small stones too clayey depth to rock
Kishona-----------------	Poor: low strength	Improbable: excess fines	Improbable: excess fines	Fair: slope small stones too clayey
216:				
Theedle-----------------	Poor: low strength depth to rock	Improbable: excess fines	Improbable: excess fines	Poor: slope
Kishona-----------------	Poor: low strength	Improbable: excess fines	Improbable: excess fines	Fair: slope small stones too clayey
Shingle-----------------	Poor: low strength depth to rock	Improbable: excess fines	Improbable: excess fines	Poor: slope depth to rock
217:				
Theedle-----------------	Poor: low strength depth to rock	Improbable: excess fines	Improbable: excess fines	Poor: slope
Shingle-----------------	Poor: low strength depth to rock	Improbable: excess fines	Improbable: excess fines	Poor: slope depth to rock
218:				
Theedle-----------------	Poor: low strength depth to rock	Improbable: excess fines	Improbable: excess fines	Fair: small stones too clayey depth to rock
Turnercrest-------------	Poor: depth to rock	Improbable: excess fines	Improbable: excess fines	Fair: small stones thin layer depth to rock
Kishona-----------------	Poor: low strength	Improbable: excess fines	Improbable: excess fines	Fair: slope small stones too clayey
219:				
Torriarents-------------	Fair: low strength shrink-swell	Improbable: excess fines	Improbable: excess fines	Poor: small stones
Torriorthents-----------	Fair: low strength shrink-swell	Improbable: excess fines	Improbable: excess fines	Poor: small stones
220:				
Pitchdraw---------------	Poor: depth to rock	Improbable: excess fines	Improbable: excess fines	Poor: slope

Construction Materials--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
220: (cont.)				
Ashollow	Good	Improbable: excess fines	Improbable: excess fines	Fair: slope
Niobrara	Poor: depth to rock	Improbable: thin layer	Improbable: too sandy	Poor: slope too sandy depth to rock
221:				
Turnercrest	Poor: depth to rock	Improbable: excess fines	Improbable: excess fines	Poor: slope
Keeline	Good	Improbable: excess fines	Improbable: excess fines	Fair: slope
Taluce	Poor: depth to rock	Improbable: excess fines	Improbable: excess fines	Poor: slope depth to rock
222:				
Turnercrest	Poor: depth to rock	Improbable: excess fines	Improbable: excess fines	Poor: slope
Wibaux, thin solum	Poor: large stones	Improbable: large stones small stones	Improbable: large stones	Poor: area reclaim slope small stones
Taluce	Poor: depth to rock	Improbable: excess fines	Improbable: excess fines	Poor: slope depth to rock
223:				
Ucross	Poor: depth to rock	Improbable: excess fines	Improbable: excess fines	Fair: small stones too clayey depth to rock
224:				
Ucross	Poor: depth to rock	Improbable: excess fines	Improbable: excess fines	Fair: small stones too clayey depth to rock
Iwait	Poor: low strength	Improbable: excess fines	Improbable: excess fines	Fair: small stones too clayey
225:				
Ucross	Poor: depth to rock	Improbable: excess fines	Improbable: excess fines	Poor: slope
Iwait	Poor: low strength	Improbable: excess fines	Improbable: excess fines	Fair: slope small stones too clayey
Fairburn	Poor: low strength depth to rock	Improbable: excess fines	Improbable: excess fines	Poor: slope depth to rock

Construction Materials--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
226:				
Ulm--------------------	Poor: low strength	Improbable: excess fines	Improbable: excess fines	Poor: thin layer
227:				
Ulm--------------------	Poor: low strength	Improbable: excess fines	Improbable: excess fines	Poor: thin layer
228:				
Ulm--------------------	Poor: low strength	Improbable: excess fines	Improbable: excess fines	Poor: thin layer
Renohill---------------	Poor: low strength depth to rock	Improbable: excess fines	Improbable: excess fines	Poor: thin layer
229:				
Ulm--------------------	Poor: low strength	Improbable: excess fines	Improbable: excess fines	Poor: too clayey
Renohill---------------	Poor: low strength depth to rock	Improbable: excess fines	Improbable: excess fines	Poor: too clayey
230:				
Urban land-------------	---	---	---	---
Deekay-----------------	Fair: low strength	Improbable: excess fines	Improbable: excess fines	Fair: small stones too clayey
Moorhead---------------	Poor: low strength	Improbable: excess fines	Improbable: excess fines	Poor: too clayey
231:				
Urban land-------------	---	---	---	---
Leiter-----------------	Poor: low strength shrink-swell depth to rock	Improbable: excess fines	Improbable: excess fines	Poor: too clayey
Moorhead---------------	Poor: low strength	Improbable: excess fines	Improbable: excess fines	Poor: too clayey
232:				
Urban land-------------	---	---	---	---
Pitchdraw--------------	Poor: depth to rock	Improbable: excess fines	Improbable: excess fines	Fair: small stones thin layer depth to rock
Ashollow---------------	Good	Improbable: excess fines	Improbable: excess fines	Fair: slope
233:				
Ustic Torriorthents-----	---	---	---	---
234:				
Ustic Torriorthents-----	---	---	---	---

Construction Materials--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
234: (cont.)				
Badland	Poor: depth to rock	Improbable: excess fines	Improbable: excess fines	Poor: depth to rock
235:				
Vonalee	Good	Improbable: excess fines	Improbable: excess fines	Good
236:				
Vonalee	Good	Improbable: excess fines	Improbable: excess fines	Good
Terro	Poor: depth to rock	Improbable: excess fines	Improbable: excess fines	Fair: small stones too sandy depth to rock
237:				
Vonalf	Good	Improbable: excess fines	Improbable: excess fines	Good
238:				
Vonalf	Good	Improbable: excess fines	Improbable: excess fines	Good
Xema	Poor: depth to rock	Improbable: excess fines	Improbable: excess fines	Fair: thin layer depth to rock
239:				
Ironbutte	Poor: large stones	Improbable: large stones small stones	Improbable: large stones	Poor: area reclaim slope small stones
Fairburn	Poor: low strength depth to rock	Improbable: excess fines	Improbable: excess fines	Poor: slope depth to rock
Mittenbutte	Poor: depth to rock	Improbable: excess fines	Improbable: excess fines	Poor: slope depth to rock
240:				
Wibaux	Poor: large stones	Improbable: large stones small stones	Improbable: large stones	Poor: area reclaim slope small stones
Wibaux, thin solum	Poor: large stones	Improbable: large stones small stones	Improbable: large stones	Poor: area reclaim slope small stones
241:				
Ironbutte	Poor: large stones	Improbable: large stones small stones	Improbable: large stones	Poor: area reclaim slope small stones

Construction Materials--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
241:(cont.)				
Ironbutte, thin solum---	Poor: large stones	Improbable: large stones small stones	Improbable: large stones	Poor: area reclaim slope small stones
242:				
Ironbutte---------------	Poor: large stones	Improbable: large stones small stones	Improbable: large stones	Poor: area reclaim slope small stones
Deekay------------------	Fair: low strength	Improbable: excess fines	Improbable: excess fines	Fair: slope small stones too clayey
Moorhead----------------	Poor: low strength	Improbable: excess fines	Improbable: excess fines	Poor: too clayey
243:				
Wibaux, thick solum-----	Fair: slope	Improbable: small stones	Probable	Poor: area reclaim slope small stones
Wibaux------------------	Poor: large stones	Improbable: large stones small stones	Improbable: large stones	Poor: area reclaim slope small stones
244:				
Muleherder--------------	Fair: slope	Improbable: small stones	Probable	Poor: area reclaim slope small stones
Ironbutte---------------	Poor: large stones	Improbable: large stones small stones	Improbable: large stones	Poor: area reclaim slope small stones
245:				
Wibaux------------------	Poor: large stones slope	Improbable: large stones small stones	Improbable: large stones	Poor: area reclaim slope small stones
Shingle-----------------	Poor: low strength slope depth to rock	Improbable: excess fines	Improbable: excess fines	Poor: slope depth to rock
Badland-----------------	---	---	---	---
246:				
Wyarno------------------	Poor: low strength	Improbable: excess fines	Improbable: excess fines	Poor: thin layer
Ulm---------------------	Poor: low strength	Improbable: excess fines	Improbable: excess fines	Poor: thin layer

Construction Materials--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
247:				
Wyotite	Fair: low strength	Improbable: excess fines	Improbable: excess fines	Fair: too clayey
Ulm	Poor: low strength	Improbable: excess fines	Improbable: excess fines	Poor: thin layer
248:				
Ziggy	Poor: low strength	Improbable: excess fines	Improbable: excess fines	Fair: small stones too clayey
Iwait	Poor: low strength	Improbable: excess fines	Improbable: excess fines	Fair: small stones too clayey
249:				
Ziggy	Poor: low strength	Improbable: excess fines	Improbable: excess fines	Fair: small stones too clayey
Iwait	Poor: low strength	Improbable: excess fines	Improbable: excess fines	Fair: small stones too clayey
250:				
Ziggy	Poor: low strength	Improbable: excess fines	Improbable: excess fines	Fair: small stones too clayey
Ucross	Poor: low strength depth to rock	Improbable: excess fines	Improbable: excess fines	Fair: small stones too clayey depth to rock
Oldwolf	Poor: depth to rock	Improbable: excess fines	Improbable: excess fines	Fair: thin layer too clayey depth to rock

Water Management

(Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Dashes (--) indicate that the map unit component was not evaluated.) The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation.

Map symbol and soil name	Limitations for-- Pond reservoir areas	Limitations for-- Embankments, dikes, and levees	Limitations for-- Aquifer-fed excavated ponds	Features affecting-- Drainage	Features affecting-- Irrigation	Features affecting-- Terraces and diversions	Features affecting-- Grassed waterways
100:							
Aridic Ustorthents, saline------------------	Moderate: seepage	Moderate: excess salt	Severe: no water	Limitation: deep to water	Limitation: excess salt droughty	Limitation: erodes easily	Limitation: erodes easily too arid droughty
101:							
Arvada, thick surface--	Moderate: slope	Severe: excess sodium	Severe: no water	Limitation: deep to water	Limitation: percs slowly slope soil blowing	Limitation: erodes easily percs slowly soil blowing	Limitation: erodes easily excess sodium too arid
102:							
Arvada, thick surface--	Moderate: slope	Severe: excess sodium	Severe: no water	Limitation: deep to water	Limitation: percs slowly slope soil blowing	Limitation: erodes easily percs slowly soil blowing	Limitation: erodes easily excess sodium too arid
Arvada----------------	Moderate: slope	Severe: excess sodium	Severe: no water	Limitation: deep to water	Limitation: percs slowly slope soil blowing	Limitation: erodes easily percs slowly soil blowing	Limitation: erodes easily excess sodium too arid
Slickspots------------	---	---	---	---	---	---	---
103:							
Arwite----------------	Severe: seepage	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: slope soil blowing	Limitation: soil blowing	Limitation: too arid
104:							
Arwite ---------------	Severe: seepage slope	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: slope soil blowing	Limitation: slope soil blowing	Limitation: slope too arid
105:							
Arwite----------------	Severe: seepage	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: slope soil blowing	Limitation: soil blowing	Limitation: too arid

Water Management- Continued

Map symbol and soil name	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
105: (cont.)							
Elwop	Moderate: seepage slope depth to rock	Moderate: piping thin layer	Severe: no water	Limitation: deep to water	Limitation: slope soil blowing depth to rock	Limitation: soil blowing depth to rock	Limitation: too arid depth to rock
106:							
Arwite	Severe: seepage slope	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: slope soil blowing	Limitation: slope soil blowing	Limitation: slope too arid
Elwop	Severe: slope	Moderate: thin layer	Severe: no water	Limitation: deep to water	Limitation: slope soil blowing depth to rock	Limitation: slope soil blowing depth to rock	Limitation: slope too arid depth to rock
107:							
Arwite	Severe: seepage	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: slope soil blowing	Limitation: soil blowing	Limitation: too arid
Vonalf	Severe: seepage	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: slope soil blowing	Limitation: soil blowing	Limitation: too arid
108:							
Arwite	Severe: seepage slope	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: slope soil blowing	Limitation: slope soil blowing	Limitation: slope too arid
Vonalf	Severe: seepage slope	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: slope soil blowing	Limitation: slope soil blowing	Limitation: slope too arid
109:							
Bidman	Moderate: seepage slope	Moderate: piping	Severe: no water	Limitation: deep to water	Limitation: percs slowly slope	Limitation: erodes easily	Limitation: erodes easily percs slowly too arid
110:							
Bidman, loamy substratum	Moderate: seepage slope	Moderate: thin layer	Severe: no water	Limitation: deep to water	Limitation: percs slowly slope	Limitation: erodes easily	Limitation: erodes easily percs slowly too arid

Water Management--Continued

Map symbol and soil name	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
111:							
Bidman	Moderate: seepage slope	Moderate: piping	Severe: no water	Limitation: deep to water	Limitation: percs slowly slope	Limitation: erodes easily	Limitation: erodes easily percs slowly too arid
Parmleed	Moderate: slope depth to rock	Severe: thin layer	Severe: no water	Limitation: deep to water	Limitation: percs slowly slope depth to rock	Limitation: erodes easily depth to rock	Limitation: erodes easily too arid depth to rock
112:							
Bidman	Severe: slope	Moderate: piping	Severe: no water	Limitation: deep to water	Limitation: percs slowly slope	Limitation: erodes easily slope	Limitation: erodes easily slope too arid
Parmleed	Severe: slope	Severe: thin layer	Severe: no water	Limitation: deep to water	Limitation: percs slowly slope depth to rock	Limitation: erodes easily slope depth to rock	Limitation: erodes easily slope too arid
113:							
Bidman	Moderate: seepage slope	Moderate: hard to pack	Severe: no water	Limitation: deep to water	Limitation: percs slowly slope	Limitation: erodes easily percs slowly	Limitation: erodes easily percs slowly too arid
Ulm	Moderate: slope	Slight	Severe: no water	Limitation: deep to water	Limitation: percs slowly slope	Limitation: erodes easily	Limitation: erodes easily percs slowly too arid
114:							
Bowbac	Severe: seepage slope	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: slope soil blowing depth to rock	Limitation: slope soil blowing depth to rock	Limitation: slope too arid depth to rock
Taluce	Severe: slope depth to rock	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: slope soil blowing depth to rock	Limitation: slope soil blowing depth to rock	Limitation: slope too arid depth to rock

Water Management--Continued

Map symbol and soil name	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
114: (cont.)							
Badland	Severe: depth to rock	Slight	Severe: no water	Limitation: deep to water	Limitation: depth to rock droughty	Limitation: depth to rock	Limitation: depth to rock droughty
115:							
Bowbac	Severe: seepage slope	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: slope soil blowing depth to rock	Limitation: slope soil blowing depth to rock	Limitation: slope too arid depth to rock
Worf	Severe: slope depth to rock	Severe: thin layer	Severe: no water	Limitation: deep to water	Limitation: slope soil blowing depth to rock	Limitation: erodes easily slope depth to rock	Limitation: erodes easily slope too arid
116:							
Cambria	Moderate: seepage slope	Moderate: piping	Severe: no water	Limitation: deep to water	Limitation: slope	Limitation: erodes easily	Limitation: erodes easily too arid
Kishona	Moderate: seepage slope	Moderate: piping	Severe: no water	Limitation: deep to water	Limitation: slope	Limitation: erodes easily	Limitation: erodes easily too arid
Zigweid	Moderate: seepage slope	Moderate: piping	Severe: no water	Limitation: deep to water	Limitation: slope	Limitation: erodes easily	Limitation: erodes easily too arid
117:							
Cambria	Severe: slope	Moderate: piping	Severe: no water	Limitation: deep to water	Limitation: slope	Limitation: erodes easily slope	Limitation: erodes easily slope too arid
Kishona	Severe: slope	Moderate: piping	Severe: no water	Limitation: deep to water	Limitation: slope	Limitation: erodes easily slope	Limitation: erodes easily slope too arid
Zigweid	Severe: slope	Moderate: piping	Severe: no water	Limitation: deep to water	Limitation: slope	Limitation: erodes easily slope	Limitation: erodes easily slope too arid

Water Management--Continued

Map symbol and soil name	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
118:							
Clarkelen	Severe: seepage	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: flooding soil blowing	Limitation: soil blowing	Limitation: too arid
Draknab	Severe: seepage	Severe: seepage piping	Severe: no water	Limitation: deep to water	Limitation: flooding soil blowing droughty	Limitation: too sandy soil blowing	Limitation: too arid droughty
119:							
Clarkelen	Severe: seepage	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: flooding soil blowing	Limitation: too sandy soil blowing	Limitation: too arid
Embry	Severe: seepage	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: soil blowing	Limitation: soil blowing	Limitation: too arid
120:							
Clarkelen	Severe: seepage	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: flooding soil blowing	Limitation: soil blowing	Limitation: too arid
Keeline	Severe: seepage	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: slope soil blowing	Limitation: soil blowing	Limitation: too arid
121:							
Cushman	Moderate: seepage slope depth to rock	Severe: thin layer	Severe: no water	Limitation: deep to water	Limitation: slope depth to rock	Limitation: erodes easily depth to rock	Limitation: erodes easily too arid depth to rock
Cambria	Moderate: seepage slope	Moderate: piping	Severe: no water	Limitation: deep to water	Limitation: slope	Limitation: erodes easily	Limitation: erodes easily too arid
122:							
Cushman	Severe: slope	Severe: thin layer	Severe: no water	Limitation: deep to water	Limitation: slope depth to rock	Limitation: erodes easily slope depth to rock	Limitation: erodes easily slope too arid

Water Management--Continued

Map symbol and soil name	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
122: (cont.)							
Cambria	Severe: slope	Moderate: piping	Severe: no water	Limitation: deep to water	Limitation: slope	Limitation: erodes easily slope	Limitation: erodes easily slope too arid
123:							
Cushman	Severe: slope	Severe: thin layer	Severe: no water	Limitation: deep to water	Limitation: slope depth to rock	Limitation: erodes easily slope depth to rock	Limitation: erodes easily slope too arid
Renohill	Severe: slope	Severe: thin layer	Severe: no water	Limitation: deep to water	Limitation: percs slowly slope depth to rock	Limitation: erodes easily slope depth to rock	Limitation: erodes easily slope too arid
124:							
Cushman	Severe: slope	Severe: thin layer	Severe: no water	Limitation: deep to water	Limitation: slope depth to rock	Limitation: erodes easily slope depth to rock	Limitation: erodes easily slope too arid
Shingle	Severe: slope depth to rock	Severe: thin layer	Severe: no water	Limitation: deep to water	Limitation: slope depth to rock	Limitation: erodes easily slope depth to rock	Limitation: erodes easily slope too arid
125:							
Cushman	Severe: slope	Severe: thin layer	Severe: no water	Limitation: deep to water	Limitation: slope depth to rock	Limitation: erodes easily slope depth to rock	Limitation: erodes easily slope too arid
Terro	Severe: seepage slope	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: slope soil blowing droughty	Limitation: slope too sandy depth to rock	Limitation: slope too arid droughty
126:							
Cushman	Moderate: seepage slope depth to rock	Severe: thin layer	Severe: no water	Limitation: deep to water	Limitation: slope depth to rock	Limitation: erodes easily depth to rock	Limitation: erodes easily too arid depth to rock

Water Management--Continued

Map symbol and soil name	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
126:(cont.)							
Theedle---------------	Moderate: seepage slope depth to rock	Severe: thin layer	Severe: no water	Limitation: deep to water	Limitation: slope depth to rock	Limitation: erodes easily depth to rock	Limitation: erodes easily too arid depth to rock
127:							
Cushman---------------	Severe: slope	Severe: thin layer	Severe: no water	Limitation: deep to water	Limitation: slope depth to rock	Limitation: erodes easily slope depth to rock	Limitation: erodes easily slope too arid
Theedle---------------	Severe: slope	Severe: thin layer	Severe: no water	Limitation: deep to water	Limitation: slope depth to rock	Limitation: erodes easily slope depth to rock	Limitation: erodes easily slope too arid
128:							
Cushman---------------	Severe: slope	Moderate: piping thin layer	Severe: no water	Limitation: deep to water	Limitation: slope depth to rock	Limitation: erodes easily slope depth to rock	Limitation: erodes easily slope too arid
Worf------------------	Severe: slope depth to rock	Severe: thin layer	Severe: no water	Limitation: deep to water	Limitation: slope depth to rock	Limitation: erodes easily slope depth to rock	Limitation: erodes easily slope too arid
129:							
Decolney--------------	Severe: seepage	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: slope soil blowing	Limitation: soil blowing	Limitation: too arid
Hiland----------------	Severe: seepage	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: slope soil blowing	Limitation: soil blowing	Limitation: too arid
130:							
Decolney--------------	Severe: seepage slope	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: slope soil blowing	Limitation: slope soil blowing	Limitation: slope too arid
Hiland----------------	Severe: seepage slope	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: slope soil blowing	Limitation: slope soil blowing	Limitation: slope too arid

Water Management--Continued

Map symbol and soil name	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
131:							
Deekay----------------	Moderate: seepage slope	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: slope	Limitation: erodes easily	Limitation: erodes easily too arid
132:							
Deekay----------------	Moderate: seepage slope	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: slope	Limitation: erodes easily	Limitation: erodes easily too arid
Moorhead--------------	Moderate: slope	Slight	Severe: no water	Limitation: deep to water	Limitation: percs slowly slope	Limitation: erodes easily	Limitation: erodes easily percs slowly too arid
133:							
Deekay----------------	Severe: slope	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: slope	Limitation: erodes easily slope	Limitation: erodes easily slope too arid
Moorhead--------------	Severe: slope	Slight	Severe: no water	Limitation: deep to water	Limitation: percs slowly slope	Limitation: erodes easily slope	Limitation: erodes easily slope too arid
134:							
Deekay----------------	Moderate: seepage slope	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: slope	Limitation: erodes easily	Limitation: erodes easily too arid
Oldwolf---------------	Moderate: seepage slope depth to rock	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: slope depth to rock	Limitation: erodes easily depth to rock	Limitation: erodes easily too arid depth to rock
135:							
Deekay----------------	Severe: slope	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: slope	Limitation: erodes easily slope	Limitation: erodes easily slope too arid

Water Management--Continued

Map symbol and soil name	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
135: (cont.)							
Oldwolf	Severe: slope	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: slope depth to rock	Limitation: erodes easily slope depth to rock	Limitation: erodes easily slope too arid
136:							
Deekay	Moderate: seepage slope	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: slope	Limitation: erodes easily	Limitation: erodes easily too arid
Ziggy	Moderate: seepage slope	Moderate: piping	Severe: no water	Limitation: deep to water	Limitation: slope	Limitation: erodes easily	Limitation: erodes easily too arid
137:							
Echeta	Moderate: slope	Moderate: hard to pack	Severe: no water	Limitation: deep to water	Limitation: erodes easily percs slowly slope	Limitation: erodes easily percs slowly	Limitation: erodes easily percs slowly too arid
138:							
Echeta	Severe: slope	Moderate: hard to pack	Severe: no water	Limitation: deep to water	Limitation: erodes easily percs slowly slope	Limitation: erodes easily percs slowly slope	Limitation: erodes easily slope too arid
Cromack	Severe: slope	Moderate: hard to pack thin layer	Severe: no water	Limitation: deep to water	Limitation: percs slowly slope depth to rock	Limitation: erodes easily slope depth to rock	Limitation: erodes easily slope too arid
139:							
Embry	Severe: seepage slope	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: slope soil blowing	Limitation: slope soil blowing	Limitation: slope too arid
Orpha	Severe: seepage slope	Severe: seepage piping	Severe: no water	Limitation: deep to water	Limitation: fast intake slope droughty	Limitation: slope too sandy soil blowing	Limitation: slope too arid droughty

Water Management--Continued

Map symbol and soil name	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
140:							
Embry	Severe: seepage slope	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: slope soil blowing	Limitation: slope soil blowing	Limitation: slope too arid
Taluce	Severe: slope depth to rock	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: slope soil blowing depth to rock	Limitation: slope soil blowing depth to rock	Limitation: slope too arid depth to rock
141:							
Emigha	Moderate: seepage	Moderate: piping	Severe: no water	Limitation: deep to water	Limitation: erodes easily excess salt	Limitation: erodes easily	Limitation: erodes easily too arid
142:							
Emigha, sodic	Slight	Moderate: piping	Severe: no water	Limitation: deep to water	Limitation: erodes easily excess salt	Limitation: erodes easily	Limitation: erodes easily too arid
Arvada, thick surface	Slight	Severe: excess sodium	Severe: no water	Limitation: deep to water	Limitation: excess sodium excess salt percs slowly	Limitation: erodes easily percs slowly	Limitation: erodes easily excess sodium too arid
143:							
Felix, ponded	Slight	Severe: hard to pack ponding	Severe: no water	Limitation: percs slowly ponding	Limitation: percs slowly slow intake ponding	Limitation: erodes easily percs slowly ponding	Limitation: erodes easily wetness too arid
144:							
Forkwood	Moderate: seepage slope	Moderate: piping	Severe: no water	Limitation: deep to water	Limitation: slope	Limitation: erodes easily	Limitation: erodes easily too arid
145:							
Forkwood	Moderate: seepage slope	Moderate: piping	Severe: no water	Limitation: deep to water	Limitation: slope	Limitation: erodes easily	Limitation: erodes easily too arid
Cambria	Moderate: seepage slope	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: slope	Limitation: erodes easily	Limitation: erodes easily too arid

Water Management--Continued

Map symbol and soil name	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
146:							
Forkwood	Moderate: seepage slope	Moderate: piping	Severe: no water	Limitation: deep to water	Limitation: slope	Limitation: erodes easily	Limitation: erodes easily too arid
Cushman	Moderate: seepage slope depth to rock	Severe: thin layer	Severe: no water	Limitation: deep to water	Limitation: slope depth to rock	Limitation: erodes easily depth to rock	Limitation: erodes easily too arid depth to rock
147:							
Forkwood	Severe: slope	Moderate: piping	Severe: no water	Limitation: deep to water	Limitation: slope	Limitation: erodes easily slope	Limitation: erodes easily slope too arid
Cushman	Severe: slope	Severe: thin layer	Severe: no water	Limitation: deep to water	Limitation: slope depth to rock	Limitation: erodes easily slope depth to rock	Limitation: erodes easily slope too arid
148:							
Forkwood	Moderate: seepage slope	Moderate: piping	Severe: no water	Limitation: deep to water	Limitation: slope	Limitation: erodes easily	Limitation: erodes easily too arid
Ulm	Moderate: slope	Slight	Severe: no water	Limitation: deep to water	Limitation: percs slowly slope	Limitation: erodes easily	Limitation: erodes easily percs slowly too arid
149:							
Forkwood	Severe: slope	Moderate: piping	Severe: no water	Limitation: deep to water	Limitation: slope	Limitation: erodes easily slope	Limitation: erodes easily slope too arid
Ulm	Severe: slope	Slight	Severe: no water	Limitation: deep to water	Limitation: percs slowly slope	Limitation: erodes easily slope	Limitation: erodes easily slope too arid

Water Management--Continued

Map symbol and soil name	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
150:							
Gateson----------------	Severe: slope	Severe: thin layer	Severe: no water	Limitation: deep to water	Limitation: fast intake slope soil blowing	Limitation: slope soil blowing depth to rock	Limitation: slope depth to rock
Taluce ---------------	Severe: slope depth to rock	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: slope soil blowing depth to rock	Limitation: slope soil blowing depth to rock	Limitation: slope too arid depth to rock
Turnercrest------------	Severe: seepage slope	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: fast intake slope soil blowing	Limitation: slope soil blowing depth to rock	Limitation: slope too arid depth to rock
151:							
Haverdad------ -------	Moderate: seepage	Moderate: piping	Severe: no water	Limitation: deep to water	Limitation: flooding	Favorable	Limitation: too arid
152:							
Haverdad---------------	Moderate: seepage	Moderate: piping	Severe: no water	Limitation: deep to water	Limitation: flooding	Favorable	Limitation: too arid
Clarkelen--------------	Severe: seepage	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: flooding soil blowing	Limitation: soil blowing	Limitation: too arid
153:							
Haverdad---------------	Moderate: seepage	Moderate: piping	Severe: no water	Limitation: deep to water	Limitation: erodes easily flooding	Limitation: erodes easily	Limitation: erodes easily too arid
Kishona----------------	Moderate: seepage slope	Moderate: piping	Severe: no water	Limitation: deep to water	Limitation: erodes easily slope	Limitation: erodes easily	Limitation: erodes easily too arid
154:							
Heldt------------------	Moderate: slope	Slight	Severe: no water	Limitation: deep to water	Limitation: erodes easily percs slowly slope	Limitation: erodes easily percs slowly	Limitation: erodes easily percs slowly too arid

Water Management--Continued

Map symbol and soil name	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
155:							
Heldt, saline	Slight	Moderate: excess salt hard to pack	Severe: no water	Limitation: deep to water	Limitation: erodes easily excess salt percs slowly	Limitation: erodes easily percs slowly	Limitation: erodes easily percs slowly too arid
Bidman, saline	Slight	Moderate: excess salt	Severe: no water	Limitation: deep to water	Limitation: excess salt percs slowly	Limitation: erodes easily percs slowly	Limitation: erodes easily percs slowly too arid
156:							
Hiland	Severe: seepage	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: slope soil blowing	Limitation: soil blowing	Limitation: too arid
157:							
Hiland	Severe: seepage	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: slope soil blowing	Limitation: soil blowing	Limitation: too arid
Bowbac	Severe: seepage	Severe: thin layer	Severe: no water	Limitation: deep to water	Limitation: slope soil blowing depth to rock	Limitation: soil blowing depth to rock	Limitation: too arid depth to rock
158:							
Hiland	Severe: seepage slope	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: slope soil blowing	Limitation: slope soil blowing	Limitation: slope too arid
Bowbac	Severe: seepage slope	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: slope soil blowing depth to rock	Limitation: slope soil blowing depth to rock	Limitation: slope too arid depth to rock
159:							
Hiland	Severe: seepage	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: slope soil blowing	Limitation: soil blowing	Limitation: too arid
Vonalee	Severe: seepage	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: slope soil blowing	Limitation: soil blowing	Limitation: too arid

Water Management--Continued

Map symbol and soil name	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
160:							
Hiland	Severe: seepage slope	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: slope soil blowing	Limitation: slope soil blowing	Limitation: slope too arid
Vonalee	Severe: seepage slope	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: slope soil blowing	Limitation: slope soil blowing	Limitation: slope too arid
161:							
Hilight	Severe: slope depth to rock	Severe: thin layer	Severe: no water	Limitation: deep to water	Limitation: percs slowly slope depth to rock	Limitation: erodes easily slope depth to rock	Limitation: erodes easily slope too arid
Taluce, cool	Severe: slope depth to rock	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: slope soil blowing depth to rock	Limitation: slope soil blowing depth to rock	Limitation: slope too arid depth to rock
Wags	Severe: slope	Moderate: hard to pack thin layer	Severe: no water	Limitation: deep to water	Limitation: percs slowly slope slow intake	Limitation: erodes easily slope depth to rock	Limitation: erodes easily slope too arid
162:							
Lismas	Severe: slope depth to rock	Severe: thin layer	Severe: no water	Limitation: deep to water	Limitation: percs slowly slope depth to rock	Limitation: erodes easily slope depth to rock	Limitation: erodes easily slope too arid
Mittenbutte, cool	Severe: slope depth to rock	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: slope soil blowing depth to rock	Limitation: slope soil blowing depth to rock	Limitation: slope too arid depth to rock
Sabatka	Severe: slope	Moderate: hard to pack thin layer	Severe: no water	Limitation: deep to water	Limitation: percs slowly slope slow intake	Limitation: erodes easily slope depth to rock	Limitation: erodes easily slope too arid

Water Management--Continued

Map symbol and soil name	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
163:							
Hilight----------------	Severe: slope depth to rock	Severe: thin layer	Severe: no water	Limitation: deep to water	Limitation: percs slowly slope slow intake	Limitation: erodes easily slope depth to rock	Limitation: erodes easily slope too arid
Wags-----------------	Severe: slope	Severe: thin layer	Severe: no water	Limitation: deep to water	Limitation: percs slowly slope depth to rock	Limitation: erodes easily slope depth to rock	Limitation: erodes easily slope too arid
Badland----------------	Severe: depth to rock	Slight	Severe: no water	Limitation: deep to water	Limitation: depth to rock droughty	Limitation: depth to rock	Limitation: depth to rock droughty
164:							
Lismas-----------------	Severe: slope depth to rock	Severe: thin layer	Severe: no water	Limitation: deep to water	Limitation: percs slowly slope slow intake	Limitation: erodes easily slope depth to rock	Limitation: erodes easily slope too arid
Sabatka----------------	Severe: slope	Severe: thin layer	Severe: no water	Limitation: deep to water	Limitation: percs slowly slope depth to rock	Limitation: erodes easily slope depth to rock	Limitation: erodes easily slope too arid
Badland--------------	Severe: depth to rock	Slight	Severe: no water	Limitation: deep to water	Limitation: depth to rock droughty	Limitation: depth to rock	Limitation: depth to rock droughty
165:							
Jayem------------------	Severe: seepage slope	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: slope soil blowing	Limitation: slope soil blowing	Limitation: slope too arid
166:							
Jaywest----------------	Moderate: slope	Moderate: piping	Severe: no water	Limitation: deep to water	Limitation: percs slowly slope	Limitation: erodes easily	Limitation: erodes easily percs slowly too arid

Water Management--Continued

Map symbol and soil name	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
167:							
Jaywest----------------	Moderate: slope	Moderate: piping	Severe: no water	Limitation: deep to water	Limitation: percs slowly slope	Limitation: erodes easily	Limitation: erodes easily percs slowly too arid
Moorhead---------------	Moderate: slope	Slight	Severe: no water	Limitation: deep to water	Limitation: percs slowly slope	Limitation: erodes easily	Limitation: erodes easily percs slowly too arid
168:							
Jaywest----------------	Moderate: slope	Moderate: piping	Severe: no water	Limitation: deep to water	Limitation: percs slowly slope	Limitation: erodes easily	Limitation: erodes easily percs slowly too arid
Spottedhorse-----------	Moderate: slope depth to rock	Moderate: thin layer	Severe: no water	Limitation: deep to water	Limitation: percs slowly slope depth to rock	Limitation: erodes easily depth to rock	Limitation: erodes easily too arid depth to rock
169:							
Julesburg--------------	Severe: seepage	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: slope soil blowing	Limitation: soil blowing	Limitation: too arid
170:							
Keeline----------------	Severe: seepage slope	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: fast intake slope droughty	Limitation: slope soil blowing	Limitation: slope too arid droughty
Tullock----------------	Severe: seepage slope	Severe: seepage piping	Severe: no water	Limitation: deep to water	Limitation: fast intake slope droughty	Limitation: slope too sandy depth to rock	Limitation: slope too arid droughty
171:							
Keeline----------------	Severe: seepage slope	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: slope soil blowing	Limitation: slope soil blowing	Limitation: slope too arid

Water Management--Continued

Map symbol and soil name	Limitations for-- Pond reservoir areas	Limitations for-- Embankments, dikes, and levees	Limitations for-- Aquifer-fed excavated ponds	Features affecting-- Drainage	Features affecting-- Irrigation	Features affecting-- Terraces and diversions	Features affecting-- Grassed waterways
171: (cont.) Tullock	Severe: seepage slope	Severe: seepage piping	Severe: no water	Limitation: deep to water	Limitation: fast intake slope droughty	Limitation: slope too sandy depth to rock	Limitation: slope too arid droughty
Niobrara, dry	Severe: slope depth to rock	Severe: seepage piping	Severe: no water	Limitation: deep to water	Limitation: fast intake slope droughty	Limitation: slope too sandy depth to rock	Limitation: slope too arid droughty
172: Keyner	Moderate: slope	Severe: excess sodium piping	Severe: no water	Limitation: deep to water	Limitation: percs slowly slope soil blowing	Limitation: erodes easily percs slowly soil blowing	Limitation: erodes easily excess sodium too arid
173: Lawver	Severe: seepage	Severe: seepage	Severe: no water	Limitation: deep to water	Limitation: percs slowly slope	Limitation: erodes easily	Limitation: erodes easily percs slowly too arid
Teckla	Severe: seepage	Moderate: thin layer	Severe: no water	Limitation: deep to water	Limitation: slope soil blowing	Limitation: erodes easily soil blowing	Limitation: erodes easily too arid
Wibaux	Severe: seepage	Severe: large stones seepage	Severe: no water	Limitation: deep to water	Limitation: large stones slope droughty	Limitation: large stones	Limitation: large stones too arid droughty
174: Brislawn	Severe: seepage	Severe: seepage	Severe: no water	Limitation: deep to water	Limitation: percs slowly slope	Limitation: erodes easily	Limitation: erodes easily percs slowly too arid
Rockybutte	Severe: seepage	Moderate: thin layer	Severe: no water	Limitation: deep to water	Limitation: slope	Limitation: erodes easily	Limitation: erodes easily too arid

Water Management--Continued

Map symbol and soil name	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
174: (cont.)							
Ironbutte	Severe: seepage	Severe: large stones, seepage	Severe: no water	Limitation: deep to water	Limitation: large stones, slope, droughty	Limitation: large stones	Limitation: large stones, too arid, droughty
175:							
Lawver	Severe: seepage, slope	Severe: seepage	Severe: no water	Limitation: deep to water	Limitation: percs slowly, slope	Limitation: erodes easily, slope	Limitation: erodes easily, slope, too arid
Wibaux	Severe: seepage, slope	Severe: large stones, seepage	Severe: no water	Limitation: deep to water	Limitation: large stones, slope, droughty	Limitation: large stones, slope	Limitation: large stones, slope, too arid
176:							
Leiter	Moderate: slope, depth to rock	Moderate: thin layer	Severe: no water	Limitation: deep to water	Limitation: percs slowly, slope, depth to rock	Limitation: erodes easily, depth to rock	Limitation: erodes easily, too arid, depth to rock
Cromack	Moderate: slope, depth to rock	Moderate: hard to pack, thin layer	Severe: no water	Limitation: deep to water	Limitation: percs slowly, slope, depth to rock	Limitation: erodes easily, percs slowly, depth to rock	Limitation: erodes easily, too arid, depth to rock
177:							
Maysdorf	Severe: seepage	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: slope, soil blowing	Limitation: erodes easily, soil blowing	Limitation: erodes easily, too arid
178:							
Maysdorf	Severe: seepage	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: slope	Limitation: erodes easily	Limitation: erodes easily, too arid

Water Management--Continued

Map symbol and soil name	Limitations for-- Pond reservoir areas	Limitations for-- Embankments, dikes, and levees	Limitations for-- Aquifer-fed excavated ponds	Features affecting-- Drainage	Features affecting-- Irrigation	Features affecting-- Terraces and diversions	Features affecting-- Grassed waterways
179:							
Maysdorf	Severe: seepage	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: slope soil blowing	Limitation: erodes easily soil blowing	Limitation: erodes easily too arid
Pugsley	Severe: seepage	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: slope soil blowing depth to rock	Limitation: too sandy soil blowing depth to rock	Limitation: too arid depth to rock
180:							
Maysdorf	Severe: seepage slope	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: slope soil blowing	Limitation: erodes easily slope soil blowing	Limitation: erodes easily slope too arid
Pugsley	Severe: seepage slope	Severe: thin layer	Severe: no water	Limitation: deep to water	Limitation: slope soil blowing depth to rock	Limitation: slope soil blowing depth to rock	Limitation: slope too arid depth to rock
181:							
Moorhead	Moderate: slope	Slight	Severe: no water	Limitation: deep to water	Limitation: erodes easily percs slowly slope	Limitation: erodes easily	Limitation: erodes easily percs slowly too arid
182:							
Moorhead	Moderate: slope	Slight	Severe: no water	Limitation: deep to water	Limitation: percs slowly slope	Limitation: erodes easily	Limitation: erodes easily percs slowly too arid
183:							
Moorhead	Moderate: slope	Slight	Severe: no water	Limitation: deep to water	Limitation: erodes easily percs slowly slope	Limitation: erodes easily	Limitation: erodes easily percs slowly too arid
Leiter	Moderate: slope depth to rock	Moderate: thin layer	Severe: no water	Limitation: deep to water	Limitation: percs slowly slope depth to rock	Limitation: erodes easily depth to rock	Limitation: erodes easily too arid depth to rock

Water Management--Continued

Map symbol and soil name	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
184:							
Moorhead----------------	Severe: slope	Slight	Severe: no water	Limitation: deep to water	Limitation: erodes easily percs slowly slope	Limitation: erodes easily slope	Limitation: erodes easily slope too arid
Leiter------------------	Severe: slope	Moderate: thin layer	Severe: no water	Limitation: deep to water	Limitation: percs slowly slope depth to rock	Limitation: erodes easily slope depth to rock	Limitation: erodes easily slope too arid
185:							
Moskee------------------	Severe: seepage	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: slope soil blowing	Limitation: soil blowing	Limitation: too arid
186:							
Moskee------------------	Severe: seepage slope	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: slope soil blowing	Limitation: slope soil blowing	Limitation: slope too arid
187:							
Nuncho------------------	Moderate: slope	Slight	Severe: no water	Limitation: deep to water	Limitation: percs slowly slope	Limitation: erodes easily	Limitation: erodes easily percs slowly too arid
188:							
Orpha-------------------	Severe: seepage slope	Severe: seepage piping	Severe: no water	Limitation: deep to water	Limitation: fast intake slope droughty	Limitation: slope too sandy soil blowing	Limitation: slope too arid droughty
Tullock-----------------	Severe: seepage slope	Severe: seepage piping	Severe: no water	Limitation: deep to water	Limitation: fast intake slope droughty	Limitation: slope too sandy depth to rock	Limitation: slope too arid droughty

Water Management--Continued

Map symbol and soil name	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
189:							
Oshoto	Moderate: seepage slope	Moderate: piping	Severe: no water	Limitation: deep to water	Limitation: erodes easily slope	Limitation: erodes easily	Limitation: erodes easily too arid
Moorhead	Moderate: slope	Slight	Severe: no water	Limitation: deep to water	Limitation: percs slowly slope	Limitation: erodes easily	Limitation: erodes easily percs slowly too arid
190:							
Parmleed	Severe: slope	Severe: thin layer	Severe: no water	Limitation: deep to water	Limitation: percs slowly slope depth to rock	Limitation: erodes easily slope depth to rock	Limitation: erodes easily slope too arid
Renohill	Severe: slope	Moderate: thin layer	Severe: no water	Limitation: deep to water	Limitation: percs slowly slope depth to rock	Limitation: erodes easily slope depth to rock	Limitation: erodes easily slope too arid
191:							
Pits	---	---	---	---	---	---	---
Dumps	---	---	---	---	---		---
192:							
Platmak	Moderate: slope	Slight	Severe: no water	Limitation: deep to water	Limitation: percs slowly slope	Limitation: erodes easily	Limitation: erodes easily percs slowly too arid
193:							
Pugsley	Severe: seepage	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: slope soil blowing depth to rock	Limitation: too sandy soil blowing depth to rock	Limitation: too arid depth to rock
Decolney	Severe: seepage	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: slope soil blowing	Limitation: soil blowing	Limitation: too arid

Water Management--Continued

Map symbol and soil name	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
194:							
Pugsley	Severe: seepage slope	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: slope soil blowing depth to rock	Limitation: slope too sandy depth to rock	Limitation: slope too arid depth to rock
Decolney	Severe: seepage slope	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: slope soil blowing	Limitation: slope soil blowing	Limitation: slope too arid
195:							
Rauzi	Severe: seepage	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: slope soil blowing	Limitation: soil blowing	Limitation: too arid
196:							
Rauzi	Severe: seepage	Moderate: piping thin layer	Severe: no water	Limitation: deep to water	Limitation: slope	Favorable	Limitation: too arid
197:							
Rauzi	Severe: seepage	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: slope soil blowing	Limitation: soil blowing	Limitation: too arid
Elwop	Moderate: seepage slope depth to rock	Moderate: thin layer	Severe: no water	Limitation: deep to water	Limitation: slope soil blowing depth to rock	Limitation: soil blowing depth to rock	Limitation: too arid depth to rock
198:							
Recluse	Moderate: seepage slope	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: slope	Limitation: erodes easily	Limitation: erodes easily too arid
199:							
Renohill	Moderate: slope depth to rock	Moderate: thin layer	Severe: no water	Limitation: deep to water	Limitation: percs slowly slope depth to rock	Limitation: erodes easily depth to rock	Limitation: erodes easily too arid depth to rock

Water Management--Continued

Map symbol and soil name	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
199: (cont.)							
Savageton	Moderate: slope depth to rock	Moderate: hard to pack thin layer	Severe: no water	Limitation: deep to water	Limitation: percs slowly slope depth to rock	Limitation: erodes easily percs slowly depth to rock	Limitation: erodes easily too arid depth to rock
200:							
Renohill	Severe: slope	Moderate: hard to pack thin layer	Severe: no water	Limitation: deep to water	Limitation: percs slowly slope depth to rock	Limitation: erodes easily slope depth to rock	Limitation: erodes easily slope too arid
Savageton	Severe: slope	Moderate: hard to pack thin layer	Severe: no water	Limitation: deep to water	Limitation: percs slowly slope depth to rock	Limitation: erodes easily slope depth to rock	Limitation: erodes easily slope too arid
201:							
Renohill	Moderate: slope depth to rock	Moderate: thin layer	Severe: no water	Limitation: deep to water	Limitation: percs slowly slope depth to rock	Limitation: erodes easily depth to rock	Limitation: erodes easily too arid depth to rock
Shingle	Severe: slope depth to rock	Severe: thin layer	Severe: no water	Limitation: deep to water	Limitation: slope depth to rock	Limitation: erodes easily slope depth to rock	Limitation: erodes easily slope too arid
Worf	Severe: slope depth to rock	Severe: thin layer	Severe: no water	Limitation: deep to water	Limitation: slope depth to rock	Limitation: erodes easily slope depth to rock	Limitation: erodes easily slope too arid
202:							
Renohill	Severe: slope	Moderate: thin layer	Severe: no water	Limitation: deep to water	Limitation: percs slowly slope depth to rock	Limitation: erodes easily slope depth to rock	Limitation: erodes easily slope too arid

Water Management--Continued

Map symbol and soil name	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
202: (cont.)							
Worfka	Severe: slope depth to rock	Severe: thin layer	Severe: no water	Limitation: deep to water	Limitation: percs slowly slope depth to rock	Limitation: erodes easily slope depth to rock	Limitation: erodes easily slope too arid
203:							
Rockypoint	Moderate: seepage	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: erodes easily flooding	Limitation: erodes easily too sandy	Limitation: erodes easily too arid
Iwait	Moderate: seepage slope	Moderate: piping	Severe: no water	Limitation: deep to water	Limitation: slope	Limitation: erodes easily	Limitation: erodes easily too arid
204:							
Samday	Severe: slope depth to rock	Severe: thin layer	Severe: no water	Limitation: deep to water	Limitation: percs slowly slope depth to rock	Limitation: erodes easily slope depth to rock	Limitation: erodes easily slope too arid
Samday, cool	Severe: slope depth to rock	Severe: thin layer	Severe: no water	Limitation: deep to water	Limitation: percs slowly slope depth to rock	Limitation: erodes easily slope depth to rock	Limitation: erodes easily slope too arid
Shingle	Severe: slope depth to rock	Severe: thin layer	Severe: no water	Limitation: deep to water	Limitation: erodes easily slope depth to rock	Limitation: erodes easily slope depth to rock	Limitation: erodes easily slope too arid
205:							
Samday	Severe: slope depth to rock	Severe: thin layer	Severe: no water	Limitation: deep to water	Limitation: percs slowly slope depth to rock	Limitation: erodes easily slope depth to rock	Limitation: erodes easily slope too arid
Savageton	Severe: slope	Severe: thin layer	Severe: no water	Limitation: deep to water	Limitation: percs slowly slope depth to rock	Limitation: erodes easily slope depth to rock	Limitation: erodes easily slope too arid

Water Management--Continued

Map symbol and soil name	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
206:							
Samday	Severe: slope depth to rock	Severe: thin layer	Severe: no water	Limitation: deep to water	Limitation: percs slowly slope slow intake	Limitation: erodes easily slope depth to rock	Limitation: erodes easily slope too arid
Shingle	Severe: slope depth to rock	Severe: thin layer	Severe: no water	Limitation: deep to water	Limitation: slope depth to rock	Limitation: erodes easily slope depth to rock	Limitation: erodes easily slope too arid
Badland	Severe: depth to rock	Slight	Severe: no water	Limitation: deep to water	Limitation: depth to rock droughty	Limitation: depth to rock	Limitation: depth to rock droughty
207:							
Cromack	Severe: slope	Moderate: hard to pack thin layer	Severe: no water	Limitation: deep to water	Limitation: percs slowly slope depth to rock	Limitation: erodes easily slope depth to rock	Limitation: erodes easily slope too arid
Fairburn	Severe: slope depth to rock	Severe: thin layer	Severe: no water	Limitation: deep to water	Limitation: slope depth to rock	Limitation: erodes easily slope depth to rock	Limitation: erodes easily slope too arid
Ucross	Severe: slope	Severe: thin layer	Severe: no water	Limitation: deep to water	Limitation: slope depth to rock	Limitation: erodes easily slope depth to rock	Limitation: erodes easily slope too arid
208:							
Savageton	Moderate: slope depth to rock	Moderate: hard to pack thin layer	Severe: no water	Limitation: deep to water	Limitation: percs slowly slope depth to rock	Limitation: erodes easily percs slowly depth to rock	Limitation: erodes easily too arid depth to rock
Silhouette	Moderate: slope	Slight	Severe: no water	Limitation: deep to water	Limitation: erodes easily slope	Limitation: erodes easily	Limitation: erodes easily too arid

Water Management--Continued

Map symbol and soil name	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
209:							
Savageton	Severe: slope	Moderate: hard to pack thin layer	Severe: no water	Limitation: deep to water	Limitation: percs slowly slope depth to rock	Limitation: erodes easily slope depth to rock	Limitation: erodes easily slope too arid
Silhouette	Severe: slope	Slight	Severe: no water	Limitation: deep to water	Limitation: erodes easily slope	Limitation: erodes easily slope	Limitation: erodes easily slope too arid
210:							
Shingle	Severe: slope depth to rock	Severe: thin layer	Severe: no water	Limitation: deep to water	Limitation: slope depth to rock	Limitation: erodes easily slope depth to rock	Limitation: erodes easily slope too arid
Taluce	Severe: slope depth to rock	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: slope soil blowing depth to rock	Limitation: slope soil blowing depth to rock	Limitation: slope too arid depth to rock
211:							
Shingle	Severe: slope depth to rock	Severe: thin layer	Severe: no water	Limitation: deep to water	Limitation: slope depth to rock	Limitation: erodes easily slope depth to rock	Limitation: erodes easily slope too arid
Worf	Severe: slope depth to rock	Severe: thin layer	Severe: no water	Limitation: deep to water	Limitation: slope depth to rock	Limitation: erodes easily slope depth to rock	Limitation: erodes easily slope too arid
212:							
Teckla	Severe: seepage	Severe: seepage	Severe: no water	Limitation: deep to water	Limitation: slope soil blowing	Limitation: erodes easily too sandy soil blowing	Limitation: erodes easily too arid
213:							
Terro	Severe: seepage slope	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: slope soil blowing droughty	Limitation: slope too sandy depth to rock	Limitation: slope too arid droughty

Water Management--Continued

Map symbol and soil name	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
213: (cont.)							
Taluce	Severe: slope depth to rock	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: slope soil blowing depth to rock	Limitation: slope soil blowing depth to rock	Limitation: slope too arid depth to rock
214:							
Theedle	Moderate: seepage slope depth to rock	Moderate: piping thin layer	Severe: no water	Limitation: deep to water	Limitation: slope depth to rock	Limitation: erodes easily depth to rock	Limitation: erodes easily too arid depth to rock
Kishona	Moderate: seepage slope	Moderate: piping	Severe: no water	Limitation: deep to water	Limitation: slope	Limitation: erodes easily	Limitation: erodes easily too arid
215:							
Theedle	Severe: slope	Severe: thin layer	Severe: no water	Limitation: deep to water	Limitation: slope depth to rock	Limitation: erodes easily slope depth to rock	Limitation: erodes easily slope too arid
Kishona	Severe: slope	Moderate: piping	Severe: no water	Limitation: deep to water	Limitation: slope	Limitation: erodes easily slope	Limitation: erodes easily slope too arid
216:							
Theedle	Severe: slope	Moderate: piping thin layer	Severe: no water	Limitation: deep to water	Limitation: slope depth to rock	Limitation: erodes easily slope depth to rock	Limitation: erodes easily slope too arid
Kishona	Severe: slope	Moderate: piping	Severe: no water	Limitation: deep to water	Limitation: slope	Limitation: erodes easily slope	Limitation: erodes easily slope too arid
Shingle	Severe: slope depth to rock	Severe: thin layer	Severe: no water	Limitation: deep to water	Limitation: slope depth to rock	Limitation: erodes easily slope depth to rock	Limitation: erodes easily slope too arid

Water Management--Continued

Map symbol and soil name	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
217:							
Theedle	Severe: slope	Moderate: piping thin layer	Severe: no water	Limitation: deep to water	Limitation: slope depth to rock	Limitation: erodes easily slope depth to rock	Limitation: erodes easily slope too arid
Shingle	Severe: slope depth to rock	Severe: thin layer	Severe: no water	Limitation: deep to water	Limitation: slope depth to rock	Limitation: erodes easily slope depth to rock	Limitation: erodes easily slope too arid
218:							
Theedle	Severe: slope	Severe: thin layer	Severe: no water	Limitation: deep to water	Limitation: slope depth to rock	Limitation: erodes easily slope depth to rock	Limitation: erodes easily slope too arid
Turnercrest	Severe: seepage slope	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: slope soil blowing depth to rock	Limitation: slope soil blowing depth to rock	Limitation: slope too arid depth to rock
Kishona	Severe: slope	Moderate: piping	Severe: no water	Limitation: deep to water	Limitation: slope	Limitation: erodes easily slope	Limitation: erodes easily slope too arid
219:							
Torriarents	Severe: slope	Moderate: piping	Severe: no water	Limitation: deep to water	Limitation: erodes easily slope	Limitation: erodes easily slope	Limitation: erodes easily slope too arid
Torriorthents	Severe: slope	Moderate: piping	Severe: no water	Limitation: deep to water	Limitation: erodes easily slope	Limitation: erodes easily slope	Limitation: erodes easily slope too arid
220:							
Pitchdraw	Severe: seepage slope	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: slope soil blowing depth to rock	Limitation: slope soil blowing depth to rock	Limitation: slope too arid depth to rock

Water Management--Continued

Map symbol and soil name	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
220: (cont.)							
Ashollow---------------	Severe: seepage slope	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: slope soil blowing	Limitation: slope soil blowing	Limitation: slope too arid
Niobrara---------------	Severe: slope depth to rock	Severe: seepage piping	Severe: no water	Limitation: deep to water	Limitation: fast intake slope droughty	Limitation: slope too sandy depth to rock	Limitation: slope too arid droughty
221:							
Turnercrest------------	Severe: seepage slope	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: slope soil blowing depth to rock	Limitation: slope soil blowing depth to rock	Limitation: slope too arid depth to rock
Keeline----------------	Severe: seepage slope	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: slope soil blowing	Limitation: slope soil blowing	Limitation: slope too arid
Taluce-----------------	Severe: slope depth to rock	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: slope soil blowing depth to rock	Limitation: slope soil blowing depth to rock	Limitation: slope too arid depth to rock
222:							
Turnercrest------------	Severe: seepage slope	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: fast intake slope soil blowing	Limitation: slope soil blowing depth to rock	Limitation: slope too arid depth to rock
Wibaux, thin solum-----	Severe: seepage slope	Severe: large stones seepage	Severe: no water	Limitation: deep to water	Limitation: large stones slope droughty	Limitation: large stones slope	Limitation: large stones slope too arid
Taluce-----------------	Severe: slope depth to rock	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: slope soil blowing depth to rock	Limitation: slope soil blowing depth to rock	Limitation: slope too arid depth to rock

Water Management--Continued

Map symbol and soil name	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
223: Ucross	Moderate: seepage slope depth to rock	Moderate: piping thin layer	Severe: no water	Limitation: deep to water	Limitation: slope depth to rock	Limitation: erodes easily depth to rock	Limitation: erodes easily too arid depth to rock
224: Ucross	Moderate: seepage slope depth to rock	Severe: thin layer	Severe: no water	Limitation: deep to water	Limitation: slope depth to rock	Limitation: erodes easily depth to rock	Limitation: erodes easily too arid depth to rock
Iwait	Moderate: seepage slope	Moderate: piping	Severe: no water	Limitation: deep to water	Limitation: slope	Limitation: erodes easily	Limitation: erodes easily too arid
225: Ucross	Severe: slope	Severe: thin layer	Severe: no water	Limitation: deep to water	Limitation: slope depth to rock	Limitation: erodes easily slope depth to rock	Limitation: erodes easily slope too arid
Iwait	Severe: slope	Moderate: piping	Severe: no water	Limitation: deep to water	Limitation: slope	Limitation: erodes easily slope	Limitation: erodes easily slope too arid
Fairburn	Severe: slope depth to rock	Severe: thin layer	Severe: no water	Limitation: deep to water	Limitation: slope depth to rock	Limitation: erodes easily slope depth to rock	Limitation: erodes easily slope too arid
226: Ulm	Moderate: slope	Slight	Severe: no water	Limitation: deep to water	Limitation: percs slowly slope	Limitation: erodes easily	Limitation: erodes easily percs slowly too arid
227: Ulm	Moderate: slope	Slight	Severe: no water	Limitation: deep to water	Limitation: erodes easily percs slowly slope	Limitation: erodes easily	Limitation: erodes easily percs slowly too arid

Water Management--Continued

Map symbol and soil name	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
228:							
Ulm	Moderate: slope	Slight	Severe: no water	Limitation: deep to water	Limitation: percs slowly slope	Limitation: erodes easily	Limitation: erodes easily percs slowly too arid
Renohill	Moderate: slope depth to rock	Moderate: thin layer	Severe: no water	Limitation: deep to water	Limitation: percs slowly slope depth to rock	Limitation: erodes easily depth to rock	Limitation: erodes easily too arid depth to rock
229:							
Ulm	Severe: slope	Slight	Severe: no water	Limitation: deep to water	Limitation: erodes easily percs slowly slope	Limitation: erodes easily slope	Limitation: erodes easily slope too arid
Renohill	Severe: slope	Moderate: thin layer	Severe: no water	Limitation: deep to water	Limitation: percs slowly slope depth to rock	Limitation: erodes easily slope depth to rock	Limitation: erodes easily slope too arid
230:							
Urban land	---	---	---	---	---	---	---
Deekay	Moderate: seepage slope	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: slope	Limitation: erodes easily	Limitation: erodes easily too arid
Moorhead	Moderate: slope	Slight	Severe: no water	Limitation: deep to water	Limitation: erodes easily percs slowly slope	Limitation: erodes easily	Limitation: erodes easily percs slowly too arid
231:							
Urban land	---	---	---	---	---	---	---
Leiter	Moderate: slope depth to rock	Moderate: thin layer	Severe: no water	Limitation: deep to water	Limitation: percs slowly slope depth to rock	Limitation: erodes easily depth to rock	Limitation: erodes easily too arid depth to rock

Water Management--Continued

Map symbol and soil name	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting - Drainage	Irrigation	Terraces and diversions	Grassed waterways
231: (cont.)							
Moorhead	Moderate: slope	Slight	Severe: no water	Limitation: deep to water	Limitation: erodes easily percs slowly slope	Limitation: erodes easily	Limitation: erodes easily percs slowly too arid
232:							
Urban land	---	---	---	---	---	---	---
Pitchdraw	Severe: seepage slope	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: slope soil blowing depth to rock	Limitation: slope soil blowing depth to rock	Limitation: slope too arid depth to rock
Ashollow	Severe: seepage slope	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: slope soil blowing	Limitation: slope soil blowing	Limitation: slope too arid
233:							
Ustic Torriorthents	---	---	---	---	---	---	---
234:							
Ustic Torriorthents	---	---	---	---	---	---	---
Badland	Severe: depth to rock	Slight	Severe: no water	Limitation: deep to water	Limitation: depth to rock droughty	Limitation: depth to rock	Limitation: depth to rock droughty
235:							
Vonalee	Severe: seepage	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: slope soil blowing	Limitation: soil blowing	Limitation: too arid
236:							
Vonalee	Severe: seepage	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: slope soil blowing	Limitation: soil blowing	Limitation: too arid

Water Management--Continued

Map symbol and soil name	Limitations for-- Pond reservoir areas	Limitations for-- Embankments, dikes, and levees	Limitations for-- Aquifer-fed excavated ponds	Features affecting-- Drainage	Features affecting-- Irrigation	Features affecting-- Terraces and diversions	Features affecting-- Grassed waterways
236: (cont.)							
Terro	Severe: seepage	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: slope soil blowing droughty	Limitation: too sandy soil blowing depth to rock	Limitation: too arid depth to rock droughty
237:							
Vonalf	Severe: seepage	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: slope soil blowing	Limitation: soil blowing	Limitation: too arid
238:							
Vonalf	Severe: seepage	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: slope soil blowing	Limitation: soil blowing	Limitation: too arid
Xema	Severe: seepage	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: slope soil blowing depth to rock	Limitation: soil blowing depth to rock	Limitation: too arid depth to rock
239:							
Ironbutte	Severe: seepage slope	Severe: large stones seepage	Severe: no water	Limitation: deep to water	Limitation: large stones slope droughty	Limitation: large stones slope	Limitation: large stones slope too arid
Fairburn	Severe: slope depth to rock	Severe: thin layer	Severe: no water	Limitation: deep to water	Limitation: slope depth to rock	Limitation: erodes easily slope depth to rock	Limitation: erodes easily slope too arid
Mittenbutte	Severe: slope depth to rock	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: slope soil blowing depth to rock	Limitation: slope soil blowing depth to rock	Limitation: slope too arid depth to rock
240:							
Wibaux	Severe: seepage slope	Severe: large stones seepage	Severe: no water	Limitation: deep to water	Limitation: large stones slope droughty	Limitation: large stones slope	Limitation: large stones slope too arid

Water Management--Continued

Map symbol and soil name	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
240: (cont.)							
Wibaux, thin solum	Severe: seepage slope	Severe: large stones seepage	Severe: no water	Limitation: deep to water	Limitation: large stones slope droughty	Limitation: large stones slope	Limitation: large stones slope too arid
241:							
Ironbutte	Severe: seepage slope	Severe: large stones seepage	Severe: no water	Limitation: deep to water	Limitation: large stones slope droughty	Limitation: large stones slope	Limitation: large stones slope too arid
Ironbutte, thin solum	Severe: seepage slope	Severe: large stones seepage	Severe: no water	Limitation: deep to water	Limitation: large stones slope droughty	Limitation: large stones slope	Limitation: large stones slope too arid
242:							
Ironbutte	Severe: seepage slope	Severe: large stones seepage	Severe: no water	Limitation: deep to water	Limitation: large stones slope droughty	Limitation: large stones slope	Limitation: large stones slope too arid
Deekay	Severe: slope	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: slope	Limitation: erodes easily slope	Limitation: erodes easily slope too arid
Moorhead	Severe: slope	Slight	Severe: no water	Limitation: deep to water	Limitation: percs slowly slope	Limitation: erodes easily slope	Limitation: erodes easily slope too arid
243:							
Wibaux, thick solum	Severe: seepage slope	Severe: seepage	Severe: no water	Limitation: deep to water	Limitation: slope droughty	Limitation: large stones slope	Limitation: large stones slope too arid
Wibaux	Severe: seepage slope	Severe: large stones seepage	Severe: no water	Limitation: deep to water	Limitation: large stones slope droughty	Limitation: large stones slope	Limitation: large stones slope too arid

Water Management--Continued

Map symbol and soil name	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
244:							
Muleherder	Severe: seepage slope	Severe: seepage	Severe: no water	Limitation: deep to water	Limitation: slope droughty	Limitation: large stones slope	Limitation: large stones slope too arid
Ironbutte	Severe: seepage slope	Severe: large stones seepage	Severe: no water	Limitation: deep to water	Limitation: large stones slope droughty	Limitation: large stones slope	Limitation: large stones slope too arid
245:							
Wibaux	Severe: seepage slope	Severe: large stones seepage	Severe: no water	Limitation: deep to water	Limitation: large stones slope droughty	Limitation: large stones slope	Limitation: large stones slope too arid
Shingle	Severe: slope depth to rock	Severe: thin layer	Severe: no water	Limitation: deep to water	Limitation: slope depth to rock	Limitation: erodes easily slope depth to rock	Limitation: erodes easily slope too arid
Badland	---	---	---	-	---	---	---
246:							
Wyarno	Moderate: slope	Slight	Severe: no water	Limitation: deep to water	Limitation: percs slowly slope	Limitation: erodes easily	Limitation: erodes easily percs slowly too arid
Ulm	Moderate: slope	Slight	Severe: no water	Limitation: deep to water	Limitation: erodes easily percs slowly slope	Limitation: erodes easily	Limitation: erodes easily percs slowly too arid
247:							
Wyotite	Moderate: seepage slope	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: erodes easily slope	Limitation: erodes easily	Limitation: erodes easily too arid
Ulm	Moderate: slope	Slight	Severe: no water	Limitation: deep to water	Limitation: erodes easily percs slowly slope	Limitation: erodes easily	Limitation: erodes easily percs slowly too arid

Water Management--Continued

Map symbol and soil name	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
248:							
Ziggy	Moderate: seepage slope	Moderate: piping	Severe: no water	Limitation: deep to water	Limitation: slope	Limitation: erodes easily	Limitation: erodes easily too arid
Iwait	Moderate: seepage slope	Moderate: piping	Severe: no water	Limitation: deep to water	Limitation: slope	Limitation: erodes easily	Limitation: erodes easily too arid
249:							
Ziggy	Moderate: seepage slope	Moderate: piping	Severe: no water	Limitation: deep to water	Limitation: slope	Limitation: erodes easily	Limitation: erodes easily too arid
Iwait	Moderate: seepage slope	Moderate: piping	Severe: no water	Limitation: deep to water	Limitation: slope	Limitation: erodes easily	Limitation: erodes easily too arid
250:							
Ziggy	Moderate: seepage slope	Moderate: piping	Severe: no water	Limitation: deep to water	Limitation: slope	Limitation: erodes easily	Limitation: erodes easily too arid
Ucross	Moderate: seepage slope depth to rock	Moderate: piping thin layer	Severe: no water	Limitation: deep to water	Limitation: slope depth to rock	Limitation: erodes easily depth to rock	Limitation: erodes easily too arid depth to rock
Oldwolf	Moderate: seepage slope depth to rock	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: slope depth to rock	Limitation: erodes easily depth to rock	Limitation: erodes easily too arid depth to rock

Soil Properties

Data relating to soil properties are collected during the course of the soil survey. The data and the estimates of soil and water features, listed in tables, are explained on the following pages.

Soil properties are determined by field examination of the soils and by laboratory index testing of some benchmark soils. Established standard procedures are followed. During the survey, many shallow borings are made and examined to identify and classify the soils and to delineate them on the soil maps.

Estimates of soil properties are based on field examinations, on laboratory tests of samples from the survey area, and on laboratory tests of samples of similar soils in nearby areas. Tests verify field observations, verify properties that cannot be estimated accurately by field observation, and help to characterize key soils.

The estimates of soil properties shown in the tables include the range of grain-size distribution and Atterberg limits, the engineering classification, and the physical and chemical properties of the major layers of each soil. Pertinent soil and water features also are given.

Engineering Index Properties

The table, "Engineering Index Properties," gives estimates of the engineering classification and of the range of index properties for the major layers of each soil in the survey area. Most soils have layers of contrasting properties within the upper 5 or 6 feet.

Depth to the upper and lower boundaries of each layer is indicated. The range in depth and information on other properties of each layer are given for each soil series under the heading "Soil Series and Their Morphology."

Texture is given in the standard terms used by the U.S. Department of Agriculture. These terms are defined according to percentages of sand, silt, and clay in the fraction of the soil that is less than 2 millimeters in diameter. "Loam," for example, is soil that is 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand. If the content of particles coarser than sand is as much as about 15 percent, an appropriate modifier is added, for example, "gravelly." Textural terms are defined in the Glossary.

Classification of the soils is determined according to the Unified soil classification system (ASTM, 1993) and the system adopted by the American Association of State Highway and Transportation Officials (AASHTO, 1986).

The Unified system classifies soils according to properties that affect their use as construction material. Soils are classified according to grain-size distribution of the fraction less than 3 inches in diameter and according to plasticity index, liquid limit, and organic matter content. Sandy and gravelly soils are identified as GW, GP, GM, GC, SW, SP, SM, and SC; silty and clayey soils as ML, CL, OL, MH, CH, and OH; and highly organic soils as PT. Soils exhibiting engineering properties of two groups can have a dual classification, for example, CL-ML.

The AASHTO system classifies soils according to those properties that affect roadway construction and maintenance. In this system, the fraction of a mineral soil that is less than 3 inches in diameter is classified in one of seven groups from A-1 through A-7 on the basis of grain-size distribution, liquid limit, and plasticity index. Soils in group A-1 are coarse grained and low in content of fines (silt and clay). At the other extreme, soils in group A-7 are fine grained. Highly organic soils are classified in group A-8 on the basis of visual inspection.

If laboratory data are available, the A-1, A-2, and A-7 groups are further classified as A-1-a, A-1-b, A-2-4, A-2-5, A-2-6, A-2-7, A-7-5, or A-7-6. As an additional refinement, the suitability of a soil as subgrade material can be indicated by a group index number. Group index numbers range from 0 for the best subgrade material to 20 or higher for the poorest. The AASHTO classification for soils tested, with group index numbers in parentheses, is given in the table.

Rock fragments larger than 10 inches in diameter and 3 to 10 inches in diameter are indicated as a percentage of the total soil on a dry-weight basis. The percentages are estimates determined mainly by

converting volume percentage in the field to weight percentage.

Percentage (of soil particles) passing designated sieves is the percentage of the soil fraction less than 3 inches in diameter based on an ovendry weight. The sieves, numbers 4, 10, 40, and 200 (USA Standard Series), have openings of 4.76, 2.00, 0.420, and 0.074 millimeters, respectively. Estimates are based on laboratory tests of soils sampled in the survey area and in nearby areas and on estimates made in the field.

Liquid limit and *plasticity index* (Atterberg limits) indicate the plasticity characteristics of a soil. The estimates are based on test data from the survey area or from nearby areas and on field examination.

The estimates of grain-size distribution, liquid limit, and plasticity index are generally rounded to the nearest 5 percent. Thus, if the ranges of gradation and Atterberg limits extend a marginal amount (1 or 2 percentage points) across classification boundaries, the classification in the marginal zone is omitted in the table.

Physical and Chemical Properties

The tables, "Physical Properties of the Soils" and "Chemical Properties of the Soils," show estimates of some characteristics and features that affect soil behavior. These estimates are given for the major layers of each soil in the survey area. The estimates are based on field observations and on test data for these and similar soils.

Depth to the upper and lower boundaries of each layer is indicated.

Clay as a soil separate consists of mineral soil particles that are less than 0.002 millimeter in diameter. In the "Physical Properties of the Soils" table, the estimated clay content of each major soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The amount and kind of clay greatly affect the fertility and physical condition of the soil. They determine the ability of the soil to adsorb cations and to retain moisture. They influence shrink-swell potential, permeability, plasticity, the ease of soil dispersion, and other soil properties. The amount and kind of clay in a soil also affect tillage and earthmoving operations.

Moist bulk density is the weight of soil (ovendry) per unit volume. Volume is measured when the soil is at field moisture capacity, that is, the moisture content at $^1/_3$-bar moisture tension. Weight is determined after the soil is dried at 105 degrees C. The estimated moist bulk density of each major soil horizon is expressed in grams per cubic centimeter of soil material that is less than 2 millimeters in diameter. Bulk density data are used to compute shrink-swell potential, available water capacity, total pore space, and other soil properties. The moist bulk density of a soil indicates the pore space available for water and roots. A bulk density of more than 1.6 can restrict water storage and root penetration. Moist bulk density is influenced by texture, kind of clay, content of organic matter, and soil structure.

Permeability refers to the ability of a soil to transmit water or air. The estimates indicate the rate of downward movement of water when the soil is saturated. They are based on soil characteristics observed in the field, particularly structure, porosity, and texture. Permeability is considered in the design of soil drainage systems and septic tank absorption fields.

Available water capacity refers to the quantity of water that the soil is capable of storing for use by plants. The capacity for water storage is given in inches of water per inch of soil for each major soil layer. The capacity varies, depending on soil properties that affect retention of water and depth of the root zone. The most important properties are the content of organic matter, soil texture, bulk density, and soil structure. Available water capacity is an important factor in the choice of plants or crops to be grown and in the design and management of irrigation systems. Available water capacity is not an estimate of the quantity of water actually available to plants at any given time.

Shrink-swell potential is the potential for volume change in a soil with a loss or gain in moisture. Volume change occurs mainly because of the interaction of clay minerals with water and varies with the amount and type of clay minerals in the soil. The size of the load on the soil and the magnitude of the change in soil moisture content influence the amount of swelling of soils in place. Laboratory measurements of swelling of undisturbed clods were made for many soils. For others, swelling was estimated on the basis of the kind and amount of clay minerals in the soil and on the basis of measurements of similar soils.

If the shrink-swell potential is rated moderate to very high, shrinking and swelling can cause damage to buildings, roads, and other structures. Special design is often needed.

Shrink-swell potential classes are based on the change in length of an unconfined clod as moisture content is increased from air-dry to field capacity. The

classes are *low*, a change of less than 3 percent; *moderate*, 3 to 6 percent; *high*, more than 6 percent; and *very high*, greater than 9 percent.

Organic matter is the plant and animal residue in the soil at various stages of decomposition. The estimated content of organic matter is expressed as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The content of organic matter in a soil can be maintained or increased by returning crop residue to the soil. Organic matter affects the available water capacity, infiltration rate, and tilth. It is a source of nitrogen and other nutrients for crops.

Erosion factor Kw indicates the susceptibility of a soil to sheet and rill erosion by water. Factor Kw is one of six factors used in the Revised Universal Soil Loss Equation (RUSLE) to predict the average annual rate of soil loss by sheet and rill erosion in tons per acre per year. The estimates are based primarily on percentage of silt, sand, and organic matter (up to 4 percent) and on soil structure and permeability. Values of Kw range from 0.02 to 0.64. Other factors being equal, the higher the value, the more susceptible the soil is to sheet and rill erosion by water.

Erosion factor Kf indicates the erodibility of the fine-earth fraction, or the material less than 2 millimeters in size.

Erosion factor T is an estimate of the maximum average annual rate of soil erosion by wind or water that can occur without affecting crop productivity over a sustained period. The rate is in tons per acre per year.

Wind erodibility groups are made up of soils that have similar properties affecting their resistance to wind erosion in cultivated areas. The groups indicate the susceptibility of soil to wind erosion. The soils assigned to group 1 are the most susceptible to wind erosion, and those assigned to group 8 are the least susceptible. The groups are as follows:

1. Coarse sands, sands, fine sands, and very fine sands.

2. Loamy coarse sands, loamy sands, loamy fine sands, loamy very fine sands, ash material, and sapric soil material.

3. Coarse sandy loams, sandy loams, fine sandy loams, and very fine sandy loams.

4L. Calcareous loams, silt loams, clay loams, and silty clay loams.

4. Clays, silty clays, noncalcareous clay loams, and silty clay loams that are more than 35 percent clay.

5. Noncalcareous loams and silt loams that are less than 20 percent clay and sandy clay loams, sandy clays, and hemic soil material.

6. Noncalcareous loams and silt loams that are more than 20 percent clay and noncalcareous clay loams that are less than 35 percent clay.

7. Silts, noncalcareous silty clay loams that are less than 35 percent clay, and fibric soil material.

8. Soils that are not subject to wind erosion because of coarse fragments on the surface or because of surface wetness.

Wind erodibility index is a numerical value indicating the susceptibility of soil to wind erosion, or the tons per acre per year that can be expected to be lost to wind erosion. There is a close correlation between wind erosion and the texture of the surface layer, the size and durability of surface clods, rock fragments, organic matter, and a calcareous reaction. Soil moisture and frozen soil layers also influence wind erosion.

In the “Chemical Properties of the Soils” table *cation-exchange capacity* is the total amount of exchangeable cations that can be held by the soil, expressed in terms of milliequivalents per 100 grams of soil at neutrality (pH 7.0) or at some other stated pH value. Soils having a low cation-exchange capacity hold fewer cations and may require more frequent applications of fertilizer than soils having a high cation-exchange capacity. Soils having a high cation-exchange capacity can retain cations. The ability to retain cations helps to prevent the pollution of ground water.

Soil reaction is a measure of acidity or alkalinity and is expressed as a range in pH values. The range in pH of each major horizon is based on many field tests. For many soils, values have been verified by laboratory analyses. Soil reaction is important in selecting crops and other plants, in evaluating soil amendments for fertility and stabilization, and in determining the risk of corrosion.

Calcium carbonate equivalent is the percent of carbonates, by weight, in the fraction of the soil less than 2 millimeters in size. The availability of plant nutrients is influenced by the amount of carbonates in the soil. Incorporating nitrogen fertilizer into calcareous soils helps to prevent nitrite accumulation and ammonium-N volatilization.

Gypsum is expressed as a percent, by weight, of hydrated calcium sulfates in the fraction of the soil less than 20 millimeters in size. Gypsum is partially soluble in water and can be dissolved and removed by water. Soils that have a high content of gypsum may collapse if the gypsum is removed by percolating water.

Salinity is a measure of soluble salts in the soil at saturation. It is expressed as the electrical conductivity of the saturation extract, in millimhos per centimeter at 25 degrees C. Estimates are based on field and laboratory measurements at representative sites of nonirrigated soils. The salinity of irrigated soils is affected by the quality of the irrigation water and by the frequency of water application. Hence, the salinity of soils in individual fields can differ greatly from the value given in the table. Salinity affects the suitability of a soil for crop production, the stability of soil if used as construction material, and the potential of the soil to corrode metal and concrete.

Sodium adsorption ratio (SAR) is a measure of the amount of sodium (Na) relative to calcium (Ca) and magnesium (Mg) in the water extract from saturated soil paste. It is the ratio of the Na concentration divided by the square root of one-half of the Ca + Mg concentration. Soils that have SAR values of 13 or more may be characterized by an increased dispersion of organic matter and clay particles, reduced permeability and aeration, and a general degradation of soil structure.

Soil Features

The table, "Soil Features," gives estimates of various soil features. The estimates are used in land use planning that involves engineering considerations.

A *restrictive layer* is a nearly continuous layer that has one or more physical, chemical, or thermal properties that significantly impede the movement of water and air through the soil or that restrict roots or otherwise provide an unfavorable root environment. Examples are bedrock, cemented layers, dense layers, and frozen layers. The table indicates the hardness and thickness of the restrictive layer, both of which significantly affect the ease of excavation. *Depth to top* is the vertical distance from the soil surface to the upper boundary of the restrictive layer.

Subsidence is the settlement of organic soils or of saturated mineral soils of very low density. Subsidence generally results from either desiccation and shrinkage or oxidation of organic material, or both, following drainage. Subsidence takes place gradually, usually over a period of several years. The table shows the expected initial subsidence, which usually is a result of drainage, and total subsidence, which results from a combination of factors.

Potential for frost action is the likelihood of upward or lateral expansion of the soil caused by the formation of segregated ice lenses (frost heave) and the subsequent collapse of the soil and loss of strength on thawing. Frost action occurs when moisture moves into the freezing zone of the soil. Temperature, texture, density, permeability, content of organic matter, and depth to the water table are the most important factors considered in evaluating the potential for frost action. It is assumed that the soil is not insulated by vegetation or snow and is not artificially drained. Silty and highly structured, clayey soils that have a high water table in winter are the most susceptible to frost action. Well drained, very gravelly, or very sandy soils are the least susceptible. Frost heave and low soil strength during thawing cause damage to pavements and other rigid structures.

Risk of corrosion pertains to potential soil-induced electrochemical or chemical action that corrodes or weakens uncoated steel or concrete. The rate of corrosion of uncoated steel is related to such factors as soil moisture, particle-size distribution, acidity, and electrical conductivity of the soil. The rate of corrosion of concrete is based mainly on the sulfate and sodium content, texture, moisture content, and acidity of the soil. Special site examination and design may be needed if the combination of factors results in a severe hazard of corrosion. The steel or concrete in installations that intersect soil boundaries or soil layers is more susceptible to corrosion than the steel or concrete in installations that are entirely within one kind of soil or within one soil layer.

For uncoated steel, the risk of corrosion, expressed as *low, moderate,* or *high,* is based on soil drainage class, total acidity, electrical resistivity near field capacity, and electrical conductivity of the saturation extract.

For concrete, the risk of corrosion also is expressed as *low, moderate,* or *high*. It is based on soil texture, acidity, and amount of sulfates in the saturation extract.

Water Features

The table," Water Features," gives estimates of various water features. The estimates are used in land use planning that involves engineering considerations.

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The four hydrologic soil groups are:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist

mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

The *months* in the table indicate the portion of the year in which the feature is most likely to be a concern.

The table indicates, by month, depth to the top (*upper limit*) and base (*lower limit*) of the saturated zone in most years. Estimates of the upper and lower limits are based mainly on observations of the water table at selected sites and on evidence of a saturated zone, namely grayish colors or mottles (redoximorphic features) in the soil. A saturated zone that lasts for less than a month is not considered a water table.

Ponding is standing water in a closed depression. Unless a drainage system is installed, the water is removed only by percolation, transpiration, or evaporation.

The table indicates *surface water depth* and the *duration* and *frequency* of ponding. Duration is expressed as *very brief* if less than 2 days, *brief* if 2 to 7 days, *long* if 7 to 30 days, and *very long* if more than 30 days. Frequency is expressed as none, rare, occasional, and frequent. *None* means that ponding is not probable; *rare* that it is unlikely but possible under unusual weather conditions (the chance of ponding is nearly 0 percent to 5 percent in any year); *occasional* that it occurs, on the average, once or less in 2 years (the chance of ponding is 5 to 50 percent in any year); and *frequent* that it occurs, on the average, more than once in 2 years (the chance of ponding is more than 50 percent in any year).

Flooding is the temporary inundation of an area caused by overflowing streams, by runoff from adjacent slopes, or by tides. Water standing for short periods after rainfall or snowmelt is not considered flooding, and water standing in swamps and marshes is considered ponding rather than flooding.

Duration and *frequency* are estimated. Duration is expressed as *extremely brief* if 0.1 hour to 4 hours, *very brief* if 4 hours to 2 days, *brief* if 2 to 7 days, *long* if 7 to 30 days, and *very long* if more than 30 days. Frequency is expressed as none, very rare, rare, occasional, frequent, and very frequent. *None* means that flooding is not probable; *very rare* that it is very unlikely but possible under extremely unusual weather conditions (the chance of flooding is less than 1 percent in any year); *rare* that it is unlikely but possible under unusual weather conditions (the chance of flooding is 1 to 5 percent in any year); *occasional* that it occurs infrequently under normal weather conditions (the chance of flooding is 5 to 50 percent in any year); *frequent* that it is likely to occur often under normal weather conditions (the chance of flooding is more than 50 percent in any year but is less than 50 percent in all months in any year); and *very frequent* that it is likely to occur very often under normal weather conditions (the chance of flooding is more than 50 percent in all months of any year).

The information is based on evidence in the soil profile, namely thin strata of gravel, sand, silt, or clay deposited by floodwater; irregular decrease in organic matter content with increasing depth; and little or no horizon development. Also considered are local information about the extent and levels of flooding and the relation of each soil on the landscape to historic floods. Information on the extent of flooding based on soil data is less specific than that provided by detailed engineering surveys that delineate flood-prone areas at specific flood frequency levels.

Hydric Soils

In this section, hydric soils are defined and described and the hydric soils in the survey area are listed.

The three essential characteristics of wetlands are hydrophytic vegetation, hydric soils, and wetland hydrology (Cowardin and others, 1979; U.S. Army Corps of Engineers, 1987; National Research Council, 1995; Tiner, 1985). Criteria for each of the characteristics must be met for areas to be identified as wetlands. Undrained hydric soils that have natural vegetation should support a dominant population of

ecological wetland plant species. Hydric soils that have been converted to other uses should be capable of being restored to wetlands.

Hydric soils are defined by the National Technical Committee for Hydric Soils (NTCHS) as soils that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part (Federal Register, 1994). These soils are either saturated or inundated long enough during the growing season to support the growth and reproduction of hydrophytic vegetation.

The NTCHS definition identifies general soil properties that are associated with wetness. In order to determine whether a specific soil is a hydric soil or nonhydric soil, however, more specific information, such as information about the depth and duration of the water table, is needed. Thus, criteria that identify those estimated soil properties unique to hydric soils have been established (Federal Register, 1995). These criteria are used to identify a phase of a soil series that normally is associated with wetlands. The criteria used are selected estimated soil properties that are described in "Soil Taxonomy" (USDA, 1999) and "Keys to Soil Taxonomy" (USDA, 1998) and in the "Soil Survey Manual" (USDA, 1993).

If soils are wet enough for a long enough period to be considered hydric, they should exhibit certain properties that can be easily observed in the field. These visible properties are indicators of hydric soils. The indicators used to make onsite determinations of hydric soils in this survey area are specified in "Field Indicators of Hydric Soils in the United States" (USDA-NRCS, 1996).

Hydric soils are identified by examining and describing the soil to a depth of about 20 inches. This depth may be greater if determination of an appropriate indicator so requires. It is always recommended that soils be excavated and described to the depth necessary for an understanding of the redoximorphic processes. Then, using the completed soil descriptions, soil scientists can compare the soil features required by each indicator and specify which indicators have been matched with the conditions observed in the soil. The soil can be identified as a hydric soil if at least one of the approved indicators is present.

The following map unit meets the definition of hydric soils and, in addition, has at least one of the hydric soil indicators. This list can help in planning land uses; however, onsite investigation is recommended to determine the hydric soils on a specific site (National Research Council, 1995; USDA-NRCS, 1996).

143—Felix clay, ponded, 0 to 2 percent slopes

Map units that are made up of hydric soils may have small areas, or inclusions, of nonhydric soils in the higher positions on the landform, and map units made up of nonhydric soils may have inclusions of hydric soils in the lower positions on the landform.

The other map units in this survey area, in general, do not meet the definition of hydric soils because they do not have one of the hydric soil indicators. A portion of these map units, however, may include hydric soils. Onsite investigation is recommended to determine whether hydric soils occur and the location of the included hydric soils.

Engineering Index Properties

(The symbol < means less than; > means greater than. Dashes (--) indicate that an assignment has not been made.)

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
100:												
Aridic Ustorthents, saline--------	0-2	Loam	CL	A-6	0	0	100	100	80-100	65-85	30-35	10-15
	2-6	Clay loam	CL	A-6, A-7	0	0	100	100	85-100	70-85	40-55	20-35
	6-46	Stratified loam to clay loam	CL	A-6	0	0	100	90-100	75-95	55-80	30-55	15-35
	46-60	Stratified fine sandy loam to clay loam	CL, SC	A-6	0	0	100	85-100	65-90	45-75	30-40	10-20
101:												
Arvada, thick surface--------	0-7	Very fine sandy loam	CL-ML, SC-SM	A-4	0	0	100	100	75-85	40-55	15-25	5-10
	7-15	Silty clay loam, clay loam	CL, CL	A-7	0	0	100	95-100	85-95	70-90	45-55	20-35
	15-26	Silty clay, clay loam, clay	CH, CL	A-7	0	0	95-100	95-100	85-95	70-90	45-65	20-40
	26-60	Clay loam, silty clay loam, clay	CH, CL	A-7	0	0	95-100	90-100	75-95	65-90	45-65	20-40
102:												
Arvada, thick surface-	0 7	Very fine sandy loam	CL-ML, SC-SM	A-4	0	0	100	100	75-85	40-55	15-25	5-10
	7-15	Silty clay loam, clay loam	CL, CH	A-7	0	0	100	95-100	85-95	70-90	45-55	20-35
	15-26	Silty clay, clay loam, clay	CH, CL	A-7	0	0	95-100	95-100	85-95	70-90	45-65	20-40
	26-60	Clay, clay loam, silty clay loam	CH, CL	A-7	0	0	95-100	90-100	75-95	65-90	45-65	20-40

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
102: (cont.)												
Arvada----------	0-2	Fine sandy loam	SM	A-4	0	0	100	95-100	80-90	35-50	20-30	NP-5
	2-9	Clay, silty clay loam, clay loam	CL, CH	A-7	0	0	100	95-100	90-95	70-90	45-60	20-40
	9-15	Clay, silty clay loam, clay loam	CL, CH	A-7	0	0	95-100	95-100	90-95	70-90	45-60	20-40
	15-60	Silty clay loam, clay loam, clay	CL, CH	A-6, A-7	0	0	95-100	95-100	85-90	65-85	40-60	20-40
Slickspots------	---	---	---	---	---	---	---	---	---	---	---	---
103:												
Arwite----------	0-5	Fine sandy loam	SC-SM	A-4	0	0	100	100	85-100	35-50	20-25	5-10
	5-32	Sandy clay loam	CL, SC	A-6	0	0	100	100	85-100	45-60	30-40	10-20
	32-60	Fine sandy loam, sandy loam	SC-SM	A-4	0	0	100	95-100	75-90	35-50	15 25	5-10
104:												
Arwite----------	0-5	Fine sandy loam	SC-SM	A-4	0	0	100	100	85-100	35-50	20-25	5-10
	5-32	Sandy clay loam	CL, SC	A-6	0	0	100	100	85-100	45-60	30-40	10-20
	32-60	Fine sandy loam, sandy loam	SC-SM	A-4	0	0	100	95-100	75-90	35-50	15-25	5-10
105:												
Arwite----------	0-5	Fine sandy loam	SC-SM	A-4	0	0	100	100	85-100	35-50	20-25	5 10
	5-32	Sandy clay loam	CL, SC	A-6	0	0	100	100	85-100	45-60	30-40	10-20
	32-60	Fine sandy loam, sandy loam	SC-SM	A-4	0	0	100	95-100	75-90	35-50	15-25	5-10
Elwop----------	0-4	Fine sandy loam	SC-SM	A-4	0	0	100	100	85-100	35-50	20-25	5-10
	4-24	Sandy clay loam	CL, SC	A-6	0	0	100	100	85 100	45-60	30-40	10-20
	24-35	Fine sandy loam, sandy loam	SC-SM	A-4	0	0	100	95-100	75-90	35-50	15 25	5-10
	35-60	Bedrock			---	---	---	---	---	---	---	---

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
106:												
Arwite----------	0-5	Fine sandy loam	SC-SM	A-4	0	0	100	100	85-100	35-50	20-25	5-10
	5-32	Sandy clay loam	CL, SC	A 6	0	0	100	100	85-100	45-60	30-40	10-20
	32-60	Fine sandy loam, sandy loam	SC-SM	A-4	0	0	100	95-100	75-90	35-50	15-25	5-10
Elwop-----------	0-4	Fine sandy loam	SC-SM	A-4	0	0	100	100	85-100	35-50	20-25	5-10
	4-24	Sandy clay loam	CL, SC	A-6	0	0	100	100	85-100	45-60	30-40	10-20
	24-35	Fine sandy loam, sandy loam	SC-SM	A-4	0	0	100	95-100	75-90	35 50	15-25	5-10
	35-60	Bedrock			---	---	---	---	---	---	---	---
107:												
Arwite----------	0 5	Fine sandy loam	SC-SM	A-4	0	0	100	100	85-100	35-50	20-25	5-10
	5-32	Sandy clay loam	CL, SC	A-6	0	0	100	100	85-100	45-60	30-40	10-20
	32-60	Fine sandy loam, sandy loam	SC-SM	A-4	0	0	100	95-100	75-90	35-50	15-25	5-10
Vonalf----------	0-6	Fine sandy loam	SC-SM	A-4	0	0	100	100	85-100	35-50	20-25	5-10
	6-34	Fine sandy loam, sandy loam	SC-SM	A-4	0	0	100	100	85-100	35-50	20-25	5-10
	34-60	Fine sandy loam, sandy loam	SC-SM	A-4	0	0	100	95-100	75-90	35-50	15-25	5-10
108:												
Arwite----------	0-5	Fine sandy loam	SC-SM	A-4	0	0	100	100	85-100	35-50	20-25	5-10
	5-32	Sandy clay loam	CL, SC	A 6	0	0	100	100	85-100	45-60	30-40	10-20
	32-60	Fine sandy loam, sandy loam	SC SM	A-4	0	0	100	95-100	75-90	35-50	15-25	5-10
Vonalf----------	0-6	Fine sandy loam	SC-SM	A-4	0	0	100	100	85-100	35-50	20-25	5-10
	6-34	Fine sandy loam, sandy loam	SC-SM	A-4	0	0	100	100	85-100	35-50	20-25	5-10
	34-60	Fine sandy loam, sandy loam	SC-SM	A-4	0	0	100	95-100	75-90	35-50	15-25	5-10

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
109:												
Bidman----------	0-2	Loam	CL, CL-ML	A-4, A-6	0	0	100	100	85-100	55-75	25 35	5 15
	2-28	Clay, clay loam	CH, CL	A-7	0	0	100	100	85-100	60-85	45-65	20-40
	28-60	Clay loam, loam	CL	A-6	0	0	100	95-100	75-95	60-80	30-55	15-35
110:												
Bidman, loamy substratum----	0-4	Loam	CL, CL-ML	A-4, A-6	0	0	100	95-100	85-95	60-80	25-35	5-15
	4-25	Clay, clay loam	CH, CL	A-7	0	0	95-100	90-100	80-95	65-85	45-65	20-40
	25-52	Clay loam	CL, CH	A-6	0	0	95-100	90-100	80-95	65-85	40-55	20-35
	52-60	Sandy clay loam, sandy loam	SC, CL	A-4	0	0	95-100	90-100	80-95	35-55	30-40	10-20
111:												
Bidman----------	0-2	Loam	CL, CL-ML	A-4, A-6	0	0	100	100	85-100	55-75	25-35	5-15
	2-28	Clay, clay loam	CH, CL	A-7	0	0	100	100	85-100	60-85	45-65	20-40
	28-60	Clay loam, loam	CL	A-6, A-7	0	0	100	95-100	80-100	60-80	30-55	15-35
Parmleed--------	0-3	Loam	CL-ML	A-4	0	0	100	90-100	80-95	50-70	20-30	5-10
	3-21	Clay, clay loam	CH, CL	A-7	0	0	100	90-100	85-95	65-85	45-65	20-40
	21-27	Clay loam, loam	CL	A-6, A-7	0	0	100	90-100	80-95	60 80	35-55	15-35
	27-60	Bedrock			---	---	---	---	---	---	---	---
112:												
Bidman----------	0-2	Loam	CL, CL-ML	A-4, A-6	0	0	100	100	85-100	55-75	25-35	5-15
	2-28	Clay, clay loam	CH, CL	A-7	0	0	100	100	85-100	60-85	45-65	20-40
	28-48	Clay loam, loam	CL	A-6, A-7	0	0	100	95-100	80-100	60-80	30-55	15-35
Parmleed--------	0-3	Loam	CL-ML	A-4	0	0	100	90-100	80-95	50-70	20-30	5-10
	3-21	Clay, clay loam	CH, CL	A-7	0	0	100	90-100	85-95	65-85	45-65	20 40
	21-27	Clay loam, loam	CL	A-6, A-7	0	0	100	90-100	80-95	60 80	35-55	15-35
	27-60	Bedrock			---	---	---	---	---	---	---	---
113:												
Bidman----------	0-7	Loam	CL, CL-ML	A-4, A-6	0	0	100	100	85-100	55-75	25-35	5-15
	7-36	Clay loam, clay	CH, CL	A-7	0	0	100	100	85-100	60-85	45-65	20-40
	36-60	Clay loam, loam	CL	A-6	0	0	100	95-100	80-100	55-75	35-55	15-35
Ulm------------	0-4	Loam	CL, CL-ML	A-4, A-6	0	0	100	95 100	80-100	60-80	25-35	5-15
	4-30	Clay loam, clay	CH, CL	A-7	0	0	95-100	90-100	80-95	65-85	40-60	20-40
	30-60	Clay loam, loam	CL	A-6, A-7	0	0	95-100	90-100	80-95	60-80	35-55	15-35

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
114:												
Bowbac----------	0-3	Sandy loam	SC-SM	A-4	0	0	95-100	90-100	65-75	35-50	20-25	5-10
	3-31	Sandy clay loam	CL, SC	A-6	0	0	95-100	90-100	75-85	45-60	30-45	15-25
	31-39	Sandy loam, fine sandy loam	SC-SM	A-2, A-4	0	0	95-100	90-100	70-80	30-45	15-25	5-10
	39-60	Bedrock			0	0	---	---	---	---	---	---
Taluce----------	0-2	Sandy loam	SC-SM	A-2, A-4	0	0	95-100	95-100	70-80	30-45	20-25	5-10
	2-14	Sandy loam, fine sandy loam	SC-SM	A-4	0	0	95-100	85-100	65-75	35-50	15-25	5-10
	14-60	Bedrock			---	---	---	---	---	---	---	---
Badland---------	0-60	Bedrock			---	---	---	---	---	---	---	---
115:												
Bowbac----------	0-3	Fine sandy loam	SC-SM	A-4	0	0	95-100	90-100	65-75	35-50	20-25	5-10
	3-31	Sandy clay loam	CL, SC	A-6	0	0	95-100	90-100	75-85	45-60	30-45	15-25
	31-39	Sandy loam, fine sandy loam	SC-SM	A-2, A-4	0	0	95-100	90-100	70-80	30-45	15-25	5-10
	39-60	Bedrock			---	---	---	---	---	---	---	---
Worf------------	0-1	Fine sandy loam	SC-SM, SM	A-4	0	0	100	90-100	70-85	35-50	20-30	NP-10
	1-12	Sandy clay loam	CL	A-6	0	0	95-100	80-100	75-95	60-80	35-40	15-20
	12-18	Sandy clay loam	CL	A-6	0	0	95-100	80-100	75-95	60-80	25-35	10-15
	18-60	Bedrock			---	---	---	---	---	---	---	---
116:												
Cambria---------	0-2	Loam	CL	A-6	0	0	100	95-100	80-90	60-80	30-35	10-15
	2-10	Clay loam, loam	CL	A-6	0	0	100	95-100	80-90	60-80	35-40	15-20
	10-60	Loam, clay loam	CL	A-6	0	0	95-100	90-100	75-90	60-80	30-35	10-15
Kishona---------	0-2	Loam	CL, CL-ML	A-4, A-6	0	0	95-100	85-100	70-90	60-80	25-35	5-15
	2-60	Loam, clay loam	CL	A-6	0	0	95-100	85-100	70-90	65-85	30-40	10-20
Zigweid---------	0-2	Loam	CL	A-6	0	0	100	100	85-95	65-85	30-35	10-15
	2-13	Clay loam, loam	CL	A-6	0	0	100	90-100	80-90	60-80	30-40	10-20
	13-60	Clay loam, loam	CL	A-6	0	0	95-100	90-100	80-90	60-80	30-40	10-20

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
117:												
Cambria----------	0-3	Loam	CL	A-6	0	0	100	95-100	80-90	60-80	30-35	10-15
	3-12	Clay loam, loam	CL	A-6	0	0	100	95-100	80-90	60-80	35-40	15-20
	12-60	Clay loam, loam	CL	A-6	0	0	95-100	90-100	75-90	60-80	30-35	10-15
Kishona----------	0-2	Loam	CL, CL-ML	A-4, A-6	0	0	95-100	85-100	70-90	60-80	25-35	5-15
	2-60	Loam, clay loam	CL	A-6	0	0	95-100	85-100	70-90	65-85	30-40	10-20
Zigweid----------	0-2	Loam	CL	A-6	0	0	100	100	85-95	65-85	30-35	10-15
	2-13	Clay loam, loam	CL	A-6	0	0	100	90-100	80-90	60-80	30-40	10-20
	13-60	Clay loam, loam	CL	A-6	0	0	95-100	90-100	80-90	60-80	30-40	10-20
118:												
Clarkelen--------	0-3	Very fine sandy loam	SC-SM	A-2, A-4	0	0	100	95-100	85-95	30-45	15-25	5-10
	3-60	Stratified loamy fine sand to loam	SC-SM	A-2, A-4	0	0	95-100	95-100	75-90	30-50	15-25	5-10
Draknab----------	0-4	Sandy loam	SC-SM	A-2, A-4	0	0	100	100	65-80	25-40	15-25	5-10
	4-28	Stratified loamy sand to fine sandy loam	SM	A-2	0	0	95-100	90-100	55-70	15-30	0-20	NP-5
	28-60	Stratified sand to sandy loam	SM, SP-SM	A-1, A-2	0	0	95-100	90-100	45-60	10-25	0-15	NP-5
119:												
Clarkelen--------	0-3	Fine sandy loam	SC-SM	A-2, A-4	0	0	100	95-100	85-95	30-45	15-25	5-10
	3-60	Stratified loamy fine sand to loam	SC-SM	A-2, A-4	0	0	95-100	95-100	75-90	30-50	15-25	5-10
Embry------------	0-3	Fine sandy loam	SM	A-2, A-4	0	0	100	95-100	70-80	25-40	0-25	NP-5
	3-60	Sandy loam, fine sandy loam	SC-SM	A-2, A-4	0	0	100	95-100	65-75	25-40	15-25	5-10
120:												
Clarkelen --	0-3	Very fine sandy loam	SC-SM	A-2, A-4	0	0	100	95-100	85-95	30-45	15-25	5-10
	3-60	Stratified loamy fine sand to loam	SC-SM	A-2, A-4	0	0	95-100	95-100	75-90	30-50	15-25	5-10

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
120: (cont.)												
Keeline---------	0-4	Sandy loam	SM, SC-SM	A-2, A-4	0	0	100	100	75-90	30-45	0-25	NP-10
	4-60	Sandy loam, fine sandy loam	SM, SC-SM	A-2, A-4	0	0	100	100	75-90	25-45	15-25	NP-10
121:												
Cushman---------	0-2	Loam	CL, CL-ML	A-4, A-6	0	0	95-100	95-100	75-90	50-70	25-35	5-15
	2-19	Clay loam, loam	CL	A-6	0	0	95-100	95-100	80-95	65-85	30-40	10-20
	19-31	Loam, clay loam	CL	A-6	0	0	95-100	95-100	80-95	65-85	30-40	10-20
	31-60	Bedrock			---	---	---	---	---	---	---	---
Cambria---------	0-2	Loam	CL	A-6	0	0	100	95-100	80-90	60-80	30-35	10-15
	2-12	Clay loam, loam	CL	A-6	0	0	100	95-100	80-90	60-80	35-40	15-20
	12-60	Loam, clay loam	CL	A-6	0	0	95-100	90-100	75-90	60-80	30-35	10-15
122:												
Cushman---------	0-2	Loam	CL	A-6, A-4	0	0	100	100	85-100	60-75	25-35	5-15
	2-23	Clay loam, loam	CL	A-6	0	0	100	100	90-100	65-80	30-40	10-25
	23-30	Loam, clay loam	CL	A-6	0	0	100	95-100	80-95	60-75	30-40	10-25
	30-60	Bedrock			---	---	---	---	---	---	---	---
Cambria---------	0-2	Loam	CL	A-6	0	0	100	100	85-100	60-75	25-35	10-15
	2-12	Clay loam, loam	CL	A 6	0	0	100	100	90-100	65-80	30-40	15-25
	12-60	Loam, clay loam	CL	A-6	0	0	100	95-100	80-95	60-75	30-35	10-20
123:												
Cushman---------	0-3	Loam	CL, CL-ML	A-4, A-6	0	0	95-100	95-100	75-90	50-70	25-35	5-15
	3-13	Clay loam, loam	CL	A-6	0	0	95-100	95-100	80-95	65-85	30-40	10-20
	13-25	Loam, clay loam	CL	A-6	0	0	95-100	95-100	80-95	65-85	30-40	10-20
	25-60	Bedrock			---	---	---	---		--	---	---
Renohill--------	0-2	Loam	CL	A-6	0	0	100	95-100	85-100	60-80	30-35	10-15
	2-14	Clay, clay loam	CH, CL	A-7	0	0	100	90-100	80-95	65-85	45-65	20-40
	14-26	Clay loam	CL	A-6, A-7	0	0	100	85-100	80-95	60-85	40-55	20-35
	26-60	Bedrock			---	---	---	---	---	---	---	---
124:												
Cushman---------	0-3	Loam	CL, CL-ML	A-4, A-6	0	0	95-100	95-100	75-90	50-70	25-35	5-15
	3-13	Clay loam, loam	CL	A-6	0	0	95-100	95-100	80-95	65-85	30-40	10-20
	13-25	Loam, clay loam	CL	A-6	0	0	95-100	95-100	80-95	65-85	30-40	10-20
	25-60	Bedrock			---	---	---	---	---	---	---	---

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
124: (cont.)												
Shingle----------	0-1	Loam	CL, CL-ML	A-4, A-6	0	0	95-100	90-100	70-90	60-80	25-35	5-15
	1-12	Loam, clay loam	CL	A-6	0	0	95-100	85-100	70-90	55-80	30-40	10-20
	12-60	Bedrock			---	---	---	---	---	---	---	---
125:												
Cushman----------	0-3	Loam	CL, CL-ML	A-4, A-6	0	0	95-100	95-100	75-90	50-70	25-35	5-15
	3-13	Clay loam, loam	CL	A-6	0	0	95-100	95-100	80-95	65-85	30-40	10-20
	13-25	Loam, clay loam	CL	A-6	0	0	95-100	95-100	80-95	65-85	30-40	10-20
	25-60	Bedrock			---	---	---	---	---	---	---	---
Terro------------	0-3	Sandy loam	SC-SM	A-2, A-4	0	0	100	95-100	65-75	30-50	20-25	5-10
	3-16	Sandy loam	SC-SM	A-2, A-4	0	0	95-100	90-100	55-75	25-45	20-25	5-10
	16-23	Sandy loam, fine sandy loam	SC-SM	A-2, A-4	0	0	95-100	90-100	55-75	25-45	15-25	5-10
	23-60	Bedrock			---	---	---	---	---	---	---	---
126:												
Cushman----------	0-2	Loam	CL, CL-ML	A-4, A-6	0	0	95-100	95-100	75-90	50-70	25-35	5-15
	2-23	Clay loam, loam	CL	A-6	0	0	95-100	95-100	80-95	65-85	30-40	10-20
	23-30	Loam, clay loam	CL	A-6	0	0	95-100	95-100	80-95	65-85	30-40	10-20
	30-60	Bedrock			---	---	---	---	---	---	---	---
Theedle----------	0-2	Loam	CL, CL-ML	A-4, A-6	0	0	95-100	95-100	70-90	55-75	25-35	5-15
	2-28	Clay loam, loam	CL	A-6	0	0	90-100	85-100	75-90	60-80	30-40	10-20
	28-60	Bedrock			---	---	---	---	---	---	---	---
127:												
Cushman----------	0-3	Loam	CL, CL-ML	A-4, A-6	0	0	95-100	95-100	75-90	50-70	25-35	5-15
	3-13	Clay loam, loam	CL	A-6	0	0	95-100	95-100	80-95	65-85	25-35	10-20
	13-25	Loam, clay loam	CL	A-6	0	0	95-100	95-100	80-95	65-85	25-35	10-20
	25-60	Bedrock			---	---	---	---	---	---	---	---
Theedle----------	0-2	Loam	CL, CL-ML	A-4, A-6	0	0	95-100	95-100	70-90	55-75	25-35	5-15
	2-28	Clay loam, loam	CL	A-6	0	0	90-100	85-100	75-90	60-80	30-40	10-20
	28-60	Bedrock			---	---	---	---		---	--	---
128:												
Cushman----------	0-5	Loam	CL, CL-ML	A-4, A-6	0	0	95-100	95-100	75-90	50-70	25-35	5-15
	5-25	Loam, clay loam	CL	A-6	0	0	95-100	95-100	80-95	65-85	30-40	10-20
	25-35	Clay loam, loam	CL	A-6	0	0	95-100	95-100	80-95	65-85	30-40	10-20
	35-60	Bedrock			---	---	---	---	---	---	---	---

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
128: (cont.)												
Worf------------	0-2	Loam	CL, CL ML	A-4, A-6	0	0	100	90-100	80-90	50-70	25-35	5-15
	2-10	Loam, clay loam	CL	A-6	0	0	95-100	80-100	75-95	60-80	35-40	15-20
	10-18	Loam, clay loam	CL	A-6	0	0	95 100	80-100	75-95	60-80	25-35	10-15
	18-60	Bedrock			---	---	---	---	---	---	---	---
129:												
Decolney--------	0-3	Fine sandy loam	SC-SM	A-4	0	0	100	100	65-80	35-50	20-25	5-10
	3-22	Sandy clay loam	CL, SC	A-6	0	0	100	100	80-90	45-60	30-40	10-20
	22-43	Sandy loam, fine sandy loam	SC-SM	A-4	0	0	100	95-100	70-85	35-50	20-25	5-10
	43-60	Sandy loam, fine sandy loam	SC-SM	A-4	0	0	100	95-100	70-85	40-55	20-25	5-10
Hiland----------	0-4	Fine sandy loam	SC-SM, SM	A-2, A-4	0	0	100	100	70-90	30-50	20-30	5-10
	4-15	Sandy clay loam	CL, SC	A-6	0	0	100	100	75-95	40-60	30-40	10-20
	15-60	Sandy loam, fine sandy loam	SC-SM, SM	A-2, A-4	0	0	100	95-100	65-85	25-45	20-30	5-10
130:												
Decolney--------	0-3	Fine sandy loam	SC-SM	A-4	0	0	100	100	65-80	35-50	20-25	5-10
	3-22	Sandy clay loam	CL, SC	A-6	0	0	100	100	80-90	45-60	30-40	10-20
	22-43	Sandy loam, fine sandy loam	SC-SM	A-4	0	0	100	95-100	70-85	35-50	20-25	5-10
	43-60	Sandy loam, fine sandy loam	SC-SM	A-4	0	0	100	95-100	70-85	40-55	20-25	5-10
Hiland----------	0-3	Fine sandy loam	SC-SM, SM	A-2, A-4	0	0	100	100	70-90	30-50	20-30	5-10
	3 32	Sandy clay loam	CL, SC	A-6	0	0	100	100	75-95	40-60	30-40	10-20
	32-60	Sandy loam, fine sandy loam	SC-SM, SM	A-2, A-4	0	0	100	95-100	65-85	25-45	20-30	5-10
131:												
Deekay----------	0-4	Loam	CL	A-6	0	0	100	100	85-100	60-75	25-35	10-15
	4-24	Clay loam, loam	CL	A-6	0	0	100	100	90-100	65-80	30-45	10-25
	24-60	Loam, clay loam	CL	A-6	0	0	100	95-100	80-100	60-75	30-45	10-25

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
132:												
Deekay----------	0-4	Loam	CL	A-6	0	0	100	100	85-100	60-75	25-35	10-15
	4-24	Clay loam, loam	CL	A-6	0	0	100	100	90-100	65-80	30-45	10-25
	24-60	Loam, clay loam	CL	A-6	0	0	100	95-100	80-100	60-75	30-45	10-25
Moorhead--------	0-5	Loam	CL	A-6	0	0	100	100	85-100	60-80	30-35	10-15
	5-35	Clay, clay loam	CH, CL	A-7	0	0	100	100	85-100	65-85	45-65	20-40
	35-60	Clay loam, clay	CL	A-6	0	0	100	90-100	85-95	60-80	40-60	20-35
133:												
Deekay----------	0-4	Loam	CL	A-6	0	0	100	100	85-100	60-75	25-35	10-15
	4-24	Clay loam, loam	CL	A-6	0	0	100	100	90-100	65-80	30-45	10-25
	24-60	Loam, clay loam	CL	A-6	0	0	100	95-100	80-100	60-75	30-45	10-25
Moorhead--------	0-5	Loam	CL	A-6	0	0	100	100	85-100	60-80	30-35	10-15
	5-35	Clay, clay loam	CH, CL	A-7	0	0	100	100	85-100	65-85	45-65	20-40
	35-60	Clay loam, clay	CL	A-6	0	0	100	90-100	85-95	60-80	40-60	20-35
134:												
Deekay----------	0-4	Loam	CL	A-6	0	0	100	100	85-100	60-75	25-35	10-15
	4-24	Clay loam, loam	CL	A-6	0	0	100	100	90-100	65-80	30-45	10-25
	24-60	Loam, clay loam	CL	A-6	0	0	100	95-100	80-100	60-75	30-45	10-25
Oldwolf---------	0-3	Loam	CL	A-6	0	0	100	100	85-100	60-75	25-35	10-15
	3-21	Clay loam, loam	CL	A-6	0	0	100	100	90-100	65-80	30-45	10-25
	21-32	Loam, clay loam	CL	A-6	0	0	100	95-100	80-95	60-75	30-45	10-25
	32-60	Bedrock			---	---	---	---	---	---	---	---
135:												
Deekay----------	0-4	Loam	CL	A-6	0	0	100	100	85-100	60-75	25-35	10-15
	4-24	Clay loam, loam	CL	A-6	0	0	100	100	90-100	65-80	30-45	10 25
	24 60	Loam, clay loam	CL	A-6	0	0	100	95-100	80-100	60 75	30-45	10-25
Oldwolf---------	0-3	Loam	CL	A-6	0	0	100	100	85-100	60-75	25-35	10-15
	3-21	Clay loam, loam	CL	A-6	0	0	100	100	90-100	65-80	30-45	10-25
	21-32	Loam, clay loam	CL	A-6	0	0	100	95-100	80-95	60-75	30-45	10-25
	32-60	Bedrock			---	---	---	---	---	---	---	---
136:												
Deekay----------	0-4	Loam	CL	A-6	0	0	100	100	85-100	60-75	25-35	10 15
	4-24	Clay loam, loam	CL	A-6	0	0	100	100	90-100	65-80	30-45	10-25
	24-60	Loam, clay loam	CL	A-6	0	0	100	95-100	80-100	60-75	30-45	10-25

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
136: (cont.)												
Ziggy-----------	0-5	Loam	CL	A-6	0	0	100	100	85-100	60-75	25-35	10-15
	5-14	Loam, clay loam	CL	A-6	0	0	100	100	90-100	65-80	30-45	10-25
	14-60	Clay loam, loam	CL	A-6	0	0	100	95-100	80-95	60-75	30-45	10-25
137:												
Echeta----------	0-3	Clay loam	CL	A-6, A-7	0	0	100	100	90-100	70-85	35-55	20-35
	3 15	Clay, clay loam	CH, CL	A-7	0	0	100	100	90-100	80-95	40-65	20-40
	15-60	Clay, clay loam	CH, CL	A-7	0	0	100	95-100	85-100	75-90	35-65	20-40
138:												
Echeta----------	0-3	Clay loam	CL	A-6, A-7	0	0	100	100	90-100	70-85	35-55	20-35
	3-15	Clay, clay loam	CH, CL	A-7	0	0	100	100	90-100	80-95	40-65	20-40
	15-60	Clay, clay loam	CH, CL	A-7	0	0	100	95-100	85-100	75-90	35-65	20-40
Cromack---------	0-6	Clay loam	CL	A-6, A-7	0	0	100	100	90-100	70-85	35-55	20-35
	6-14	Clay, clay loam	CH, CL	A-7	0	0	100	100	90-100	80-95	40-65	20-40
	14-29	Clay, clay loam	CH, CL	A-7	0	0	100	95-100	85-100	75-90	35-65	20-40
	29-60	Bedrock			---	---	---	---	---	---	---	---
139:												
Embry-----------	0-4	Fine sandy loam	SM	A-2, A 4	0	0	100	95-100	70-80	25-40	0-25	NP-5
	4-60	Sandy loam, fine sandy loam	SC-SM	A-2, A-4	0	0	100	95 100	65 75	25-40	15-25	5-10
Orpha-----------	0-4	Fine sand	SM	A-2	0	0	100	95-100	70-80	15-25	0-15	NP-5
	4-60	Fine sand	SM, SP-SM	A-2	0	0	100	95-100	60-80	10-30	0-15	NP-5
140:												
Embry-----------	0-6	Sandy loam	SM	A-2, A-4	0	0	100	95-100	60-70	25-40	0-25	NP-5
	6-60	Sandy loam, fine sandy loam	SC-SM	A-2, A-4	0	0	100	95-100	65-75	25-40	15-25	5-10
Taluce-------	0-4	Sandy loam	SC-SM	A-2, A-4	0	0	95-100	95-100	70-80	30-45	20-25	5-10
	4 16	Sandy loam, fine sandy loam	SC-SM	A-2, A-4	0	0	95-100	85-100	70-80	30-45	15-25	5-10
	16-60	Bedrock			---	---	---	---	---	---	---	---

Engineering Index Properties -Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
141:												
Emigha----------	0-1	Loam	CL	A-6	0	0	100	100	90-100	75-90	30-35	10-15
	1-19	Silty clay loam, clay loam	CL	A-6	0	0	100	100	95 100	80-95	35-40	15-20
	19-60	Stratified loam to silty clay loam	CL	A-6	0	0	100	95-100	95-100	80-95	30-40	10-20
142:												
Emigha, sodic---	0-3	Silty clay loam	CL	A-6	0	0	100	100	95-100	85-95	35-40	15-20
	3-14	Silty clay loam, clay loam	CL	A-6	0	0	100	100	90-100	85-95	35-40	15-20
	14-60	Stratified silt loam to silty clay	CL	A-6	0	0	100	100	85-95	70-90	30-40	10-20
Arvada, thick surface--------	0 3	Loam	CL, CL-ML	A-4, A-6	0	0	100	100	85-100	55-70	25-35	5-15
	3-12	Silty clay loam, clay loam	CL, CH	A-7	0	0	100	95-100	85-95	70-90	45-55	20-35
	12-30	Silty clay, clay loam	CH, CL	A-7	0	0	95-100	95-100	85-95	70 90	45-65	20-40
	30-46	Silty clay loam, clay loam, clay	CH, CL	A-7	0	0	95 100	90-100	75-95	65-90	45-65	20-40
	46-60	Silty clay loam, clay loam, clay	CL, CH	A-7	0	0	95-100	90-100	75-95	65-90	45-60	20-40
143:												
Felix, ponded---	0-5	Clay	CH	A-7	0	0	100	100	100	90-100	70-90	45-60
	5-30	Clay	CH	A-7	0	0	100	100	100	90-100	75-90	50-65
	30-50	Clay	CH	A-7	0	0	100	100	100	90-100	75-90	50-60
	50-60	Clay	CH	A-7	0	0	100	100	100	90-100	65-85	40-55
144:												
Forkwood--------	0-2	Loam	CL	A-4, A-6	0	0	100	100	85-100	60-75	25-35	5-15
	2-23	Clay loam, loam	CL	A-6	0	0	100	100	90-100	65-80	30-40	10-25
	23-60	Loam, clay loam	CL	A-6	0	0	100	95-100	80-95	60-75	30-40	10-25

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas- ticity index
	In				Pct	Pct					Pct	
145:												
Forkwood--------	0-3	Loam	CL, CL-ML	A-4, A-6	0	0	100	95-100	80-90	60-80	25-35	5-15
	3-14	Clay loam, loam	CL	A-6	0	0	100	95-100	85-95	60-80	30-40	10-20
	14-60	Loam, clay loam	CL	A-6	0	0	100	95-100	85-95	60-80	30-40	10-20
Cambria	0-2	Loam	CL	A-6	0	0	100	95-100	80-90	60-80	30-35	10-15
	2-12	Clay loam, loam	CL	A-6	0	0	100	95-100	80-90	60-80	35-40	15-20
	12-60	Loam, clay loam	CL	A-6	0	0	95-100	90-100	75-90	60-80	30-35	10-15
146:												
Forkwood--------	0-2	Loam	CL, CL-ML	A-4, A-6	0	0	100	100	85-100	60-75	25-35	5-15
	2-23	Clay loam, loam	CL	A-6	0	0	100	100	90-100	65-80	30-40	10-25
	23-60	Loam, clay loam	CL	A-6	0	0	100	95-100	80-95	60-75	30-40	10-25
Cushman---------	0-2	Loam	CL	A-4, A-6	0	0	100	100	85-100	60-75	25-35	5-15
	2-23	Clay loam, loam	CL	A-6	0	0	100	100	90-100	65-80	30-40	10-25
	23-30	Loam, clay loam	CL	A-6	0	0	100	95-100	80-95	60-75	30-40	10-25
	30-60	Bedrock			---	---	---	---	---	---	---	---
147:												
Forkwood--------	0-2	Loam	CL	A-6, A-6	0	0	100	100	85-100	60-75	25-35	5-15
	2-23	Clay loam, loam	CL	A-6	0	0	100	100	90-100	65-80	30-40	10-25
	23-60	Loam, clay loam	CL	A-6	0	0	100	95-100	80-95	60-75	30-40	10-25
Cushman	0-2	Loam	CL	A-4, A-6	0	0	100	100	85-100	60-75	25-35	5-15
	2-23	Clay loam, loam	CL	A-6	0	0	100	100	90-100	65-80	30-40	10-25
	23-30	Loam, clay loam	CL	A-6	0	0	100	95-100	80-95	60-75	30-40	10-25
	30-60	Bedrock			---	---	---	---	---	---	---	---
148:												
Forkwood--------	0-2	Loam	CL	A-4, A-6	0	0	100	100	85-100	60-75	25-35	5-15
	2-23	Clay loam, loam	CL	A-6	0	0	100	100	90-100	65-80	30-40	10-25
	23-60	Loam, clay loam	CL	A-6	0	0	100	95-100	80-95	60-75	30-40	10-25
Ulm-------------	0-2	Loam	CL	A-6	0	0	100	100	85-100	60-75	25-35	10-15
	2-22	Clay, clay loam	CH, CL	A-7	0	0	100	100	90-100	80-95	40-65	25-40
	22-60	Clay loam, loam	CL	A-6	0	0	100	95-100	85-100	75-90	35-55	20-40
149:												
Forkwood--------	0-2	Loam	CL	A-4, A-6	0	0	100	100	85-100	60-75	25-35	5-15
	2-23	Clay loam, loam	CL	A-6	0	0	100	100	90-100	65-80	30-40	10-25
	23-60	Loam, clay loam	CL	A-6	0	0	100	95-100	80-95	60-75	30-40	10-25

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
149: (cont.)												
Ulm-----	0 2	Loam	CL	A-6	0	0	100	100	85-100	60-75	25-35	10-15
	2-22	Clay, clay loam	CH, CL	A-7	0	0	100	100	90-100	80-95	40-65	25-40
	22-60	Clay loam, loam	CL	A-6	0	0	100	95-100	85-100	75-90	35-55	15-35
150:												
Gateson---------	0-2	Slightly decomposed plant material			---	---	---	---	--	---	---	---
	2-6	Loamy fine sand	SM	A-2	0	0	95-100	90-100	60-85	25-35	0-15	NP-5
	6-11	Stratified loamy fine sand to sandy clay loam	SC-SM	A-2, A-4	0	0	95-100	90-100	60-85	25-45	20-35	5-15
	11-30	Sandy clay loam	CL, SC	A-6	0	0	90-100	85-100	60-80	45-60	30-40	10-20
	30-60	Bedrock			---	---	---	---	---	---	---	---
Taluce----------	0-3	Sandy loam	SC-SM	A-2, A-4	0	0	95 100	95-100	70-80	30-45	20-25	5-10
	3-16	Sandy loam, fine sandy loam	SC-SM	A-2, A 4	0	0	95-100	85-100	70-80	30-45	15-25	5-10
	16 60	Bedrock			---	---	---	---	---	---	---	---
Turnercrest-----	0-4	Loamy fine sand	SM, SP-SM	A-2	0	0	95-100	85-100	75-90	10-25	0-15	NP-5
	4-32	Sandy loam, fine sandy loam	SM	A-2, A-4	0	0	95-100	85-100	65-80	30-50	20-25	NP-5
	32-60	Bedrock			---	---	---	---	---	---	---	---
151:												
Haverdad--------	0-4	Loam	CL	A-4, A-6	0	0	100	100	85-100	60-75	25-35	5-15
	4-60	Stratified fine sandy loam to loam	CL	A-6	0	0	100	95-100	90-100	60-80	25-40	10-25
152:												
Haverdad--------	0-3	Loam	CL, CL-ML	A-4, A-6	0	0	100	100	80-90	60-75	25-35	5-15
	3-60	Stratified fine sandy loam to clay loam	CL	A-6	0	0	100	100	75-95	55-70	30-40	10-20

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
152: (cont.)												
Clarkelen-------	0-4	Fine sandy loam	SC-SM	A-2, A-4	0	0	100	95-100	85-95	30-45	15-25	5-10
	4-60	Stratified loamy fine sand to loam	SC-SM	A-2, A-4	0	0	95-100	95-100	75-90	30-50	15-25	5-10
153:												
Haverdad--------	0-7	Clay loam	CL	A-6	0	0	100	100	90-95	65-80	35-40	15-20
	7-60	Stratified very fine sandy loam to clay loam	CL	A-6	0	0	100	100	75-95	60-75	30-40	10-20
Kishona --------	0-3	Clay loam	CL	A-6	0	0	95-100	90-100	75-95	65-80	35-40	15-20
	3-60	Clay loam, loam	CL	A-6	0	0	95-100	85-100	70-90	65-85	30-40	10-20
154:												
Heldt-----------	0-3	Clay loam	CL	A-7	0	0	95-100	95-100	90-100	70-85	35-55	20-35
	3-25	Clay, silty clay	CH	A-7	0	0	95-100	95-100	85-100	80-95	55-65	35-40
	25-60	Silty clay, clay, clay loam	CH, CL	A-7	0	0	95-100	95-100	90-100	80-95	45-60	25-40
155:												
Heldt, saline---	0-2	Clay loam	CL	A-6	0	0	100	100	90-100	75-90	35-55	20-35
	2-22	Clay	CH, CL	A-7	0	0	100	100	90-100	85-95	45-65	25-40
	22-60	Clay, clay loam	CH, CL	A-7	0	0	100	95-100	85-100	80-95	45-65	25-40
Bidman, saline--	0-4	Loam	CL	A-6	0	0	100	100	85-100	60-75	25-35	10-15
	4-13	Clay	CH, CL	A-7	0	0	100	100	90-100	80-95	40-65	20-40
	13-60	Clay loam, clay	CL	A-6, A-7	0	0	100	95-100	85-100	75-90	35-60	20-35
156:												
Hiland----------	0-3	Fine sandy loam	SC-SM	A-2, A-4	0	0	100	100	70-90	30-50	20-30	5-10
	3-19	Sandy clay loam	CL, SC	A-6	0	0	100	100	75-95	40-60	30-40	10-20
	19-60	Sandy loam, fine sandy loam	SC-SM	A-2, A-4	0	0	100	95-100	65-85	25-45	20-30	5-10

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
157:												
Hiland----------	0-4	Fine sandy loam	SC-SM	A-2, A-4	0	0	100	100	70-90	30-50	20-30	5-10
	4-24	Sandy clay loam	CL, SC	A-6	0	0	100	100	75-95	40-60	30-40	10-20
	24-60	Sandy loam, fine sandy loam	SC-SM	A-2, A 4	0	0	100	95-100	65-85	25-45	20-30	5-10
Bowbac----------	0-3	Fine sandy loam	SC-SM	A-4	0	0	95-100	90-100	65-75	35-50	20-25	5-10
	3-31	Sandy clay loam	CL, SC	A-6	0	0	95-100	90-100	75-85	45-60	30-45	15-25
	31-39	Sandy loam, fine sandy loam	SC-SM	A-2, A-4	0	0	95-100	90-100	70-80	30-45	15-25	5-10
	39-60	Bedrock			0	0	---	---	---	---	---	---
158:												
Hiland----------	0-4	Fine sandy loam	SC-SM	A-2, A-4	0	0	100	100	70-90	30-50	20-30	5-10
	4-24	Sandy clay loam	CL, SC	A-6	0	0	100	100	75 95	40-60	30-40	10-20
	24-60	Sandy loam, fine sandy loam	SC-SM	A-2, A-4	0	0	100	95 100	65-85	25-45	20-30	5-10
Bowbac----------	0-3	Fine sandy loam	SC-SM	A-4	0	0	95-100	90-100	65-75	35-50	20-25	5-10
	3-31	Sandy clay loam	CL, SC	A-6	0	0	95-100	90-100	75-85	45-60	30-45	15-25
	31-39	Sandy loam, fine sandy loam	SC SM	A-2, A-4	0	0	95-100	90-100	70-80	30-45	15-25	5-10
	39-60	Bedrock			0	0	---	---	-	---	---	---
159:												
Hiland----------	0-3	Fine sandy loam	SC-SM	A-2, A-4	0	0	100	100	70-90	30-50	20-30	5-10
	3-23	Sandy clay loam	CL, SC	A-6	0	0	100	100	75-95	40-60	30-40	10-20
	23-60	Fine sandy loam, sandy loam	SC-SM	A-2, A-4	0	0	100	95-100	65-85	25-45	20-30	5-10
Vonalee---------	0-5	Fine sandy loam	SC-SM	A-2, A-4	0	0	100	100	70-80	30-45	20-25	5-10
	5-16	Sandy loam, fine sandy loam	SC-SM	A-2, A-4	0	0	100	100	70-80	30-45	20-25	5-10
	16-60	Sandy loam, fine sandy loam	SC-SM	A-2, A 4	0	0	100	95-100	70-80	25-45	15-25	5-10

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
160:												
Hiland----------	0-3	Fine sandy loam	SC-SM	A-2, A-4	0	0	100	100	70-90	30-50	20-30	5-10
	3-23	Sandy clay loam	CL, SC	A-6	0	0	100	100	75-95	40-60	30-40	10-20
	23-60	Fine sandy loam, sandy loam	SC-SM	A-2, A-4	0	0	100	95-100	65-85	25-45	20-30	5-10
Vonalee---------	0-5	Fine sandy loam	SC-SM	A-2, A-4	0	0	100	100	70-80	30-45	20-25	5-10
	5-24	Sandy loam, fine sandy loam	SC-SM	A-2, A-4	0	0	100	100	70-80	30-45	20-25	5-10
	24-60	Sandy loam, fine sandy loam	SC-SM	A-2, A-4	0	0	100	95-100	70-80	25-45	15-25	5-10
161:												
Hilight---------	0-2	Clay loam	CL	A-7	0	0	95-100	95-100	85-100	65-85	40-55	20 35
	2-14	Clay, silty clay	CH	A-7	0	0	95-100	90-100	85-100	70-90	55-70	35-45
	14-60	Bedrock			---	---	---	---	---	---	---	---
Taluce, cool----	0 4	Sandy loam	SC-SM	A-2, A-4	0	0	95-100	95-100	70-80	30-45	20-25	5-10
	4-18	Sandy loam, fine sandy loam	SC-SM	A-2, A-4	0	0	95-100	85-100	70-80	30-45	15-25	5-10
	18-60	Bedrock			---	---	---	---	---	---		---
Wags------------	0-4	Clay	CH, CL	A-7	0	0	90-100	75-95	70-90	60-85	45-55	20-30
	4-34	Clay, silty clay	CH	A-7	0	0	100	85-100	80-100	75-95	55-75	35-50
	34-60	Bedrock			---	---	---	---	---	---	---	---
162:												
Lismas----------	0-3	Clay loam	CL	A-7	0	0	100	100	90-100	70-85	35 55	20-35
	3-16	Clay	CH	A-7	0	0	100	90-100	85 100	75-90	55-75	35-50
	16-60	Bedrock			---	---	---	---	---	---	---	---
Mittenbutte, cool-------	0-4	Fine sandy loam	SC-SM	A-4	0	0	100	100	85-100	35-50	20-25	5-10
	4-18	Fine sandy loam, sandy loam	SC-SM	A-4	0	0	100	90-100	75-90	35-50	15-25	5-10
	18-60	Bedrock			---	---	---	---	---	---	--	---

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
162: (cont.)												
Sabatka---------	0-3	Clay loam	CL	A-6, A-7	0	0	100	100	90-100	70-85	35-55	20-35
	3-19	Clay, clay loam	CH	A-7	0	0	100	100	90-100	80-95	45-65	25-40
	19-30	Clay, clay loam	CH	A-7	0	0	100	95-100	85-100	75-90	35-60	20-40
	30-60	Bedrock			---	---	---	---	---	---	---	---
163:												
Hilight---------	0-2	Clay	CH	A-7	0	0	95-100	90-100	85-100	70-90	55-70	35-45
	2 12	Clay, silty clay	CH	A-7	0	0	95-100	90-100	85-100	70-90	55-70	35-45
	12-60	Bedrock			---	---	---	---	---	---	---	---
Wags-----------	0-1	Channery clay loam	CL, SC, GC	A-6, A-7	0	0	70-95	50-75	45-70	40-65	40-55	20-35
	1-23	Silty clay, clay	CH	A-7	0	0	100	85-100	80-100	75-95	55-75	35-50
	23-60	Bedrock			---	---	---	---	---	---	---	---
Badland---------	0-60	Bedrock			---	---	---	---	---	---	---	---
164:												
Lismas----------	0-3	Clay loam	CL	A-7	0	0	100	100	90-100	70-85	35-55	20-35
	3-16	Clay	CH	A-7	0	0	100	90-100	85-100	75-90	55-75	35-50
	16-60	Bedrock			---	---	---	---	---	---	---	---
Sabatka---------	0-3	Clay loam	CL	A-6, A-7	0	0	100	100	90-100	70-85	35-55	20-35
	3-19	Clay, clay loam	CH	A-7	0	0	100	100	90-100	80-95	45-65	25-40
	19-30	Clay, clay loam	CH	A-7	0	0	100	95-100	85-100	75-90	35-60	20-40
	30-60	Bedrock			---	---	---	---	---	---		---
Badland-	0 60	Bedrock			---	---	---	---	---	---	---	---
165:												
Jayem-----------	0-17	Fine sandy loam	SC-SM	A-2, A-4	0	0	100	100	55-70	20-40	20-25	5-10
	17-31	Fine sandy loam, sandy loam	SC-SM	A-2, A-4	0	0	100	100	65-75	30-45	20-25	5-10
	31-60	Fine sandy loam, sandy loam	SC-SM	A-2, A-4	0	0	100	100	60 75	25 40	0-25	5-10

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments >10 inches	Fragments 3-10 inches	Percentage passing sieve number-- 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
166:												
Jaywest---------	0-7	Loam	CL	A-6	0	0	100	100	85-100	60-75	25-35	10-15
	7-36	Clay, clay loam	CH, CL	A-7	0	0	100	100	90-100	80-95	40-65	20-40
	36-60	Clay loam, loam	CL	A-6	0	0	100	95-100	80-95	60-75	35-55	15-35
167:												
Jaywest---------	0-7	Loam	CL	A-6	0	0	100	100	85-100	60-75	25-35	10-15
	7-36	Clay, clay loam	CH, CL	A-7	0	0	100	100	90-100	80-95	40-65	20-40
	36-60	Clay loam, loam	CL	A-6	0	0	100	95-100	80-95	60-75	35-55	15-35
Moorhead - ----	0-5	Loam	CL	A-6	0	0	100	100	85-100	60-80	30-35	10-15
	5-35	Clay, clay loam	CH, CL	A-7	0	0	100	100	85-100	65-85	45-65	20-40
	35-60	Clay loam, clay	CL	A-6	0	0	100	90-100	85-95	60-80	40-60	20-35
168:												
Jaywest---------	0-7	Loam	CL	A-6	0	0	100	100	85-100	60-75	25-35	10-15
	7-36	Clay, clay loam	CH, CL	A-7	0	0	100	100	90-100	80-95	40-65	20-40
	36-60	Clay loam, loam	CL	A-6	0	0	100	95-100	80-95	60-75	35 55	15-35
Spottedhorse----	0-4	Loam	CL	A-6	0	0	100	100	85-100	60-75	25-35	10-15
	4-27	Clay, clay loam	CH, CL	A-7	0	0	100	100	90-100	80-95	40-65	20-40
	27-35	Clay loam, clay	CL	A-6, A-7	0	0	100	95-100	85-100	75-90	35-60	20-40
	35-60	Bedrock			---	---	---	---	---	---	---	---
169:												
Julesburg-------	0-10	Fine sandy loam	SC-SM	A-2, A-4	0	0	100	100	65-80	30-45	20-25	5 10
	10-32	Fine sandy loam, sandy loam	SC-SM	A-4	0	0	100	100	70-85	35 50	20-25	5-10
	32-60	Fine sandy loam, sandy loam	SC-SM	A-2, A-4	0	0	100	100	65-80	30-45	15-25	5-10
170:												
Keeline---------	0-6	Loamy sand	SM	A-2	0	0	100	100	70-95	20-35	0-10	NP 5
	6-60	Fine sandy loam, sandy loam	SC-SM	A-4	0	0	100	95-100	75-90	35-50	15-25	5-10
Tullock---------	0-4	Loamy sand	SM	A-4	0	0	100	100	70-95	35-50	0-0	NP
	4-28	Loamy sand, loamy fine sand, sand	SM	A-2	0	0	100	95-100	40-55	20-35	0-15	NP-5
	28-60	Bedrock			---	---	---	--	---	---	---	---

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
171:												
Keeline---------	0-4	Sandy loam	SM, SC-SM	A-2, A-4	0	0	100	100	75-90	30-45	0-25	NP-10
	4-60	Sandy loam, fine sandy loam	SM, SC-SM	A-2, A-4	0	0	100	100	75-90	25-45	15-25	NP-10
Tullock-------	0-4	Loamy sand	SP SM, SM	A-2	0	0	100	100	55-65	10-25	0-0	NP
	4-22	Loamy sand, sand, loamy fine sand	SP-SM, SM	A-2	0	0	100	100	55-65	10-25	0-15	NP-5
	22-60	Bedrock			---	---	---	---	---	---	---	---
Niobrara, dry---	0-3	Loamy sand	SP-SM, SM	A-2	0	0	100	100	65-80	10-25	0-15	NP-5
	3-12	Sand, loamy sand	SP-SM, SM	A-2	0	0	100	85-100	60-75	10-20	0-15	NP-5
	12-60	Bedrock			---	---	---	---	---	---	---	---
172:												
Keyner----------	0-4	Fine sandy loam	SM	A-4	0	0	100	100	85-90	35-50	20-30	NP-5
	4-12	Clay loam, sandy clay loam	CL, SC	A-6	0	0	100	100	90-95	45-60	30-40	10-20
	12-20	Sandy clay loam, clay loam	CL, SC	A-6	0	0	100	95-100	85-95	45-60	30-40	10-20
	20-26	Sandy clay loam, clay loam	CL, SC	A-6	0	0	100	95-100	85-95	45-60	30-40	10-20
	26-60	Sandy clay loam, fine sandy loam, sandy loam	SC, SC-SM	A-4, A-6	0	0	100	95-100	70-85	35-50	20-30	5-15

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas- ticity index
	In				Pct	Pct					Pct	
173:												
Lawver----------	0-4	Loam	CL, CL-ML	A-4	0	0	100	90-100	85-95	60-80	25-30	5-10
	4-20	Clay loam, clay	CH, CL	A-7	0	0	90-100	75-90	70-85	55-70	45-65	20-40
	20-27	Channery clay loam, channery clay	CL, SC, CH	A-7	0	0-5	80-95	60-90	55-85	45-75	45-60	20-40
	27-38	Very channery clay loam, very channery loam	CL, SC, GC	A-2, A-6	0	0-15	45-80	35-70	30-60	25-55	35-40	15-20
	38-60	Extremely channery sandy loam	GM, GP-GM GC-GM	A-1	0-15	15-30	35-50	25-40	20-30	5-20	0-25	NP-5
Teckla----------	0-10	Very fine sandy loam	SC-SM, SM, CL-ML, ML	A-4	0	0	90-100	90-100	75-95	45-65	20-30	NP-10
	10-23	Sandy clay loam, clay loam	CL, SC	A-6	0	0	90-100	90-100	70-95	40-75	30-40	10-20
	23-31	Channery loam, channery clay loam	CL, SC	A-6	0	0	65-85	50-75	40-70	30-55	30-40	10-20
	31-45	Very channery loam, very channery sandy loam	GC, GC-GM, SC, SC-SM	A-1, A-2	0	0-5	30-60	25-55	10-40	5-35	20-35	5-15
	45-60	Very channery sandy loam, extremely channery sandy loam	GM, GP-GM GC-GM	A-1	0-5	0-15	25-55	10-50	5-30	5-20	0-25	NP-5
Wibaux----------	0-3	Very channery loam	GC-GM, GC	A-1, A-2	0	0-5	45-60	35-50	30-45	20-35	25-35	5-15
	3-13	Very channery loam, extremely channery loam	GC	A-1, A-2	0-5	0-25	30-55	20-45	15-35	10-30	25-35	5-15
	13-60	Fragmental material	GP	A-1	5-15	60-70	0-10	0-10	0-5	0-5	0-0	NP

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
174:												
Brislawn--------	0-6	Loam	CL	A-4, A-6	0	0	100	100	85-100	60-75	25-35	5-15
	6-21	Clay, clay loam	CH, CL	A-7	0	0	100	100	90-100	80-95	40-65	20-40
	21-31	Channery clay loam, channery clay	CH, SC, GC	A-6, A-7	0	0	70-85	65-80	55-70	45-60	35-60	20-35
	31-37	Very channery clay loam, very channery loam	GC	A-2	0-5	5-15	45-60	35-50	30-45	20-35	30-45	10-25
	37-60	Fragmental material	GP	A-1	5-15	60-70	0-10	0-10	0-5	0-5	---	---
Rockybutte------	0-5	Loam	CL	A-4, A-6	0	0	100	100	85-100	60-75	25-35	5-15
	5-23	Clay loam, loam	CL	A-6	0	0	100	100	90-100	65-80	30-45	10-25
	23-38	Extremely channery loam, very channery loam	GC	A-2	0-5	5-15	40-55	20-40	15-30	10-25	30-40	10-20
	38-60	Fragmental material	GP	A-1	5-15	60-70	0-10	0-10	0-5	0-5	---	---
Ironbutte-------	0-4	Channery loam	GC-GM, GC, SC	A-4	0	0-5	65-80	60-75	40-60	35-50	25-35	5-15
	4-12	Very channery loam, extremely channery loam	GC-GM, GC	A-2, A-1	0-5	0-25	30-45	25-40	10-30	5-25	20-35	5-15
	12-60	Fragmental material	GP	A-1	5-15	60-70	0-10	0-10	0-5	0-5	0-0	NP
175:												
Lawver----------	0-4	Loam	CL, CL-ML	A-4	0	0	100	90-100	85-95	60-80	25-30	5-10
	4-20	Clay loam, clay	CH, CL	A-7	0	0	90-100	75-90	70-85	55-70	45-65	20-40
	20-27	Channery clay loam, channery clay	CL, SC, CH	A-7	0	0-5	80-95	60-90	55-85	45-75	45-60	20-40
	27-38	Very channery clay loam, very channery loam	CL, SC, GC	A-2, A-6	0	0-15	45-80	35-70	30-60	25-55	35-40	15-20
	38-60	Extremely channery sandy loam	GP, GP-GM GC-GM	A-1	0-15	15-30	35-50	25-40	20-30	5-20	0-25	NP-5

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
175: (cont.)												
Wibaux----------	0-3	Very channery loam	GC-GM, GC	A-1, A-2	0	0-5	45-60	35-50	30-45	20-35	25-35	5-15
	3-13	Very channery loam, extremely channery loam	GC	A-1, A-2	0-5	0-25	30-55	20-45	15-35	10-30	25-35	5-15
	13-60	Fragmental material	GP	A-1	5-15	60-70	0-10	0-10	0-5	0-5	0-0	NP
176:												
Leiter----------	0-3	Clay loam	CL	A-6	0	0	100	100	90-100	70-85	35-45	15-25
	3-22	Clay, clay loam	CH, CL	A-7	0	0	100	100	90-100	80-95	45-65	25-40
	22-33	Clay loam, clay	CL	A-6	0	0	100	95-100	85-100	75-90	35-60	20-40
	33-60	Bedrock			---	---	---	---	---	---	---	---
Cromack---------	0-6	Clay loam	CL	A-6	0	0	100	100	90-100	70-85	35-55	20-35
	6-14	Clay, clay loam	CH, CL	A-7	0	0	100	100	90-100	80-95	40-65	20-40
	14-29	Clay, clay loam	CH, CL	A-7	0	0	100	95-100	85-100	75-90	35-65	20-40
	29-60	Bedrock			---	---	---	---	---	---	---	---
177:												
Maysdorf--------	0-3	Fine sandy loam	SC-SM	A-2, A-4	0	0	100	95-100	60-75	30-50	20-30	5-10
	3-33	Sandy clay loam	CL, SC	A-6	0	0	95-100	90-100	65-80	40-60	30-40	10-20
	33-60	Fine sandy loam, sandy loam	SC-SM	A-4	0	0	95-100	90-100	60-75	35-50	20-30	5-10
178:												
Maysdorf--------	0-5	Sandy clay loam	CL, SC	A-6	0	0	100	95-100	65-80	40-60	30-35	10-15
	5-26	Sandy clay loam	CL, SC	A-6	0	0	95-100	90-100	65-80	40-60	30-40	10-20
	26-60	Fine sandy loam, sandy loam	SC-SM	A-4	0	0	95-100	90-100	60-75	35-50	20-30	5-10
179:												
Maysdorf-------	0-5	Sandy loam	SC-SM	A-2, A-4	0	0	100	95-100	60-75	30-50	20-30	5-10
	5-20	Sandy clay loam	CL, SC	A-6	0	0	95-100	90-100	65-80	40-60	30-40	10-20
	20-60	Fine sandy loam, sandy loam	SC-SM	A-4	0	0	95-100	90-100	60-75	35-50	20-30	5-10

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
179: (cont.)												
Pugsley---------	0-4	Sandy loam	SC-SM	A-2, A-4	0	0	90-100	90-100	60-75	25-40	20-25	5-10
	4-15	Sandy clay loam	CL, SC	A-6	0	0	90-100	90-100	80-90	45-60	30-40	10-20
	15-23	Fine sandy loam, sandy loam	SC-SM	A-2	0	0	90-100	90-100	65-75	20-35	15-25	5-10
	23-60	Bedrock			---	---	---	---	---	---	---	---
180:												
Maysdorf--------	0-5	Sandy loam	SC-SM	A-2, A-4	0	0	100	95-100	60-75	30-50	20-30	5-10
	5-20	Sandy clay loam	CL, SC	A-6	0	0	95-100	90-100	65-80	40-60	30-40	10-20
	20-60	Fine sandy loam, sandy loam	SC-SM	A-4	0	0	95-100	90-100	60-75	35-50	20-30	5-10
Pugsley---------	0-4	Sandy loam	SC-SM	A-2, A-4	0	0	90 100	90-100	60-75	25-40	20 25	5-10
	4-15	Sandy clay loam	CL, SC	A-6	0	0	90-100	90-100	80-90	45-60	30-40	10-20
	15-23	Fine sandy loam, sandy loam	SC-SM	A-2	0	0	90-100	90-100	65-75	20-35	15-25	5-10
	23-60	Bedrock			---	---	---	---	---	---	---	---
181:												
Moorhead--------	0-4	Clay loam	CL	A-6	0	0	100	100	90-100	70-85	35-45	15-25
	4-24	Clay, clay loam	CH, CL	A-7	0	0	100	100	90-100	80-95	40-65	20-40
	24-60	Clay loam, clay	CL	A-6	0	0	100	95-100	85-100	75-90	35-60	20-40
182:												
Moorhead--------	0-3	Loam	CL	A-6	0	0	100	100	60-75	60-75	30-35	10-15
	3-25	Clay loam, clay	CH, CL	A-7, A-6	0	0	100	100	90-100	80-95	45-60	25-40
	25-60	Clay loam, clay	CL	A-6	0	0	100	95-100	85-100	75-90	35-60	20-35
183:												
Moorhead--------	0-4	Clay loam	CL	A-6	0	0	100	100	90-100	70-85	35-45	15-25
	4-24	Clay, clay loam	CH, CL	A-7	0	0	100	100	90-100	80-95	40-65	20-40
	24-60	Clay loam, clay	CL	A 6	0	0	100	95-100	85-100	75-90	35-60	20-40
Leiter----------	0-3	Clay loam	CL	A-6	0	0	100	100	90-100	70-85	35-45	15-25
	3-22	Clay, clay loam	CH, CL	A-7	0	0	100	100	90-100	80-95	45-65	25-40
	22-33	Clay loam, clay	CL	A-6	0	0	100	95-100	85-100	75-90	35-60	20-40
	33-60	Bedrock			---	---	---	---	---	---	---	---

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
184:												
Moorhead--------	0-4	Clay loam	CL	A-6	0	0	100	100	90-100	70-85	35-45	15-25
	4-24	Clay, clay loam	CH, CL	A-7	0	0	100	100	90-100	80-95	40-65	20-40
	24-60	Clay loam, clay	CL	A-6	0	0	100	95-100	85-100	75-90	35-60	20-40
Leiter----------	0-3	Clay loam	CL	A-6	0	0	100	100	90-100	70-85	35-45	15-25
	3-22	Clay, clay loam	CH, CL	A-7	0	0	100	100	90-100	80-95	45-65	25-40
	22-33	Clay loam, clay	CL	A-6	0	0	100	95-100	85-100	75-90	35-45	15-40
	33-60	Bedrock			---	---	---	---	---	---	---	---
185:												
Moskee----------	0-9	Fine sandy loam	SC-SM	A-4	0	0	100	100	85-100	35-50	20-25	5-10
	9-32	Sandy clay loam	SC, CL	A-6	0	0	100	100	85-100	45-60	30-40	10-20
	32-60	Fine sandy loam, sandy loam	SC-SM	A-4	0	0	100	95-100	75-90	35-50	15-25	5-10
186:												
Moskee----------	0-4	Fine sandy loam	SC-SM	A-2, A-4	0	0	100	100	75-85	30-45	20-25	5-10
	4-16	Sandy clay loam	CL, SC	A-6	0	0	100	100	75-85	40-60	30-40	10-20
	16-60	Fine sandy loam, sandy loam	SC-SM	A-4	0	0	100	95-100	70-80	35-50	20-30	5-10
187:												
Nuncho----------	0-12	Loam	CL	A-6	0	0	100	100	85-100	60-75	30-35	10-15
	12-30	Clay, clay loam	CL, CH	A-7	0	0	100	100	90-100	80-95	40-60	20-40
	30-60	Clay loam	CL	A-6	0	0	100	95-100	85-100	75-90	35-60	20-35
188:												
Orpha-----------	0-4	Loamy sand	SM	A-2	0	0	100	95-100	50-70	20-30	0-15	NP-5
	4-60	Loamy sand, fine sand	SP-SM, SM	A-2	0	0	100	95-100	60-80	10-30	0-15	NP-5
Tullock---------	0-8	Loamy sand	SP-SM, SM	A-2	0	0	100	100	55-65	10-25	0-0	NP
	8-30	Loamy sand, fine sand, sand	SP-SM, SM	A-2	0	0	100	100	65-75	10-25	0-15	NP-5
	30-60	Bedrock			---	---	---	--		---		--

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
189:												
Oshoto	0-7	Silt loam	CL	A-6	0	0	95-100	95-100	85-100	70-90	25-35	10-15
	7-32	Silty clay loam, clay loam	CL	A-6	0	0	95-100	95-100	90-100	85-95	35-45	15-25
	32-60	Silt loam, silty clay loam	CL	A-6	0	0	95-100	95-100	90-100	85-95	30-40	10-20
Moorhead	0-5	Loam	CL	A-6	0	0	100	100	85-100	60-80	30-35	10-15
	5-35	Clay, clay loam	CH, CL	A-7	0	0	100	100	85-100	65-85	45-65	20-40
	35-60	Clay loam, clay	CL	A-6	0	0	100	90-100	85-95	60-80	40-60	20-35
190:												
Parmleed	0-3	Loam	CL-ML, CL	A-4	0	0	100	90-100	80-95	50-70	20-30	5-10
	3-21	Clay, clay loam	CH, CL	A-7	0	0	100	90-100	85-95	65-85	45-65	20-40
	21-27	Clay loam, loam	CL	A-6, A-7	0	0	100	90-100	80-95	60-80	35-55	15-35
	27-60	Bedrock			---	---	---	---	---	---	---	---
Renohill	0-4	Clay loam	CL	A-6	0	0	100	95-100	85-100	65-85	35-40	15-20
	4 24	Clay, clay loam	CH, CL	A-7	0	0	100	90-100	85-100	65-85	45-65	20-40
	24-35	Clay loam	CL	A-6, A-7	0	0	100	85-100	80-95	60-85	40-55	20-35
	35-60	Bedrock			---	---	---	---	---	---	---	---
191:												
Pits	---	---	---	---	---	---	---	---	---	---	---	---
Dumps	---	---	---	---	---	--	---	---	---	---	---	---
192:												
Platmak	0-4	Loam	CL	A-4, A-6	0	0	100	100	85-100	60-75	25-35	5-15
	4-27	Clay, clay loam	CH, CL	A-7	0	0	100	100	90-100	80-95	40-65	20-40
	27-60	Clay loam	CL	A-6, A-7	0	0	100	95-100	85-100	75-90	35-60	20-35
193:												
Pugsley	0-3	Sandy loam	SC-SM	A-2, A-4	0	0	90-100	90 100	60-75	25-40	20-25	5-10
	3-13	Sandy clay loam	CL, SC	A-6	0	0	90-100	90-100	80-90	45-60	30-40	10-20
	13-25	Sandy loam, loamy sand, fine sandy loam	SC-SM	A 2	0	0	90-100	90-100	65-75	20-35	15-25	5-10
	25-60	Bedrock			---	---	---	---	---	---	---	---

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas-ticity index
	In				Pct	Pct					Pct	
193: (cont.)												
Decolney--------	0-3	Sandy loam	SC-SM	A-4	0	0	100	100	65-80	35-50	20-25	5-10
	3-22	Sandy clay loam	CL, SC	A-6	0	0	100	100	80-90	45-60	30-40	10-20
	22-43	Sandy loam, fine sandy loam	SC-SM	A-4	0	0	100	95-100	70-85	35-50	20-25	5-10
	43-60	Sandy loam, fine sandy loam	SC-SM	A-4	0	0	100	95-100	70-85	35-50	20-25	5-10
194:												
Pugsley---------	0-3	Sandy loam	SC-SM	A-2, A-4	0	0	90-100	90-100	60-75	25-40	20-25	5-10
	3-13	Sandy clay loam	CL, SC	A-6	0	0	90-100	90-100	80-90	45-60	30-40	10-20
	13-25	Sandy loam, loamy sand, fine sandy loam	SC-SM	A-2	0	0	90-100	90-100	65-75	20-35	15-25	5-10
	25-60	Bedrock			---	---	---	---	---	---	---	---
Decolney--------	0-3	Sandy loam	SC-SM	A-4	0	0	100	100	65-80	35-50	20-25	5-10
	3-22	Sandy clay loam	CL, SC	A-6	0	0	100	100	80-90	45-60	30-40	10-20
	22-43	Sandy loam, fine sandy loam	SC-SM	A-4	0	0	100	95-100	70-85	35-50	20-25	5-10
	43-60	Sandy loam, fine sandy loam	SC-SM	A-4	0	0	100	95-100	70-85	35-50	20-25	5-10
195:												
Rauzi-----------	0-3	Fine sandy loam	SC-SM	A-2, A-4	0	0	100	100	75-90	30-50	20-30	5-10
	3-30	Sandy clay loam	CL, SC	A-6	0	0	100	100	80-90	35-55	30-40	10-20
	30-60	Sandy loam, fine sandy loam	SC-SM	A-2, A-4	0	0	100	95-100	70-85	30-50	20-30	5-10
196:												
Rauzi-----------	0-6	Sandy clay loam	SC	A-6	0	0	100	100	80-90	35-50	30-35	10-15
	6-30	Sandy clay loam	CL, SC	A-6	0	0	100	100	80-90	35-55	30-40	10-20
	30-60	Sandy loam, fine sandy loam	SC-SM	A-2, A-4	0	0	100	95-100	70-85	30-50	20-30	5-10

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	Percentage passing sieve number--: 10	Percentage passing sieve number--: 40	Percentage passing sieve number--: 200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
197:												
Rauzi-----------	0-3	Fine sandy loam	SC-SM	A-2, A-4	0	0	100	100	75-90	30-50	20-30	5-10
	3-30	Sandy clay loam	CL, SC	A-6	0	0	100	100	80-90	35-55	30-40	10-20
	30-60	Sandy loam, fine sandy loam	SC-SM	A-2, A-4	0	0	100	95-100	70-85	30-50	20-30	5-10
Elwop-----------	0-4	Fine sandy loam	SC-SM	A-4	0	0	100	100	85-100	35-50	20-25	5-10
	4-24	Sandy clay loam	CL, SC	A-6	0	0	100	100	85 100	45-60	30-40	10-20
	24-35	Fine sandy loam, sandy loam	SC-SM	A-4	0	0	100	95-100	75-90	35-50	15-25	5-10
	35-60	Bedrock			---	---	---	---	---	---	---	---
198:												
Recluse -------	0-5	Loam	CL	A-4, A-6	0	0	100	100	85-100	60-75	25-35	5-15
	5-23	Clay loam, loam	CL	A-6	0	0	100	100	90-100	65-80	35-45	15-25
	23-60	Loam, clay loam	CL	A-6	0	0	100	95-100	80-95	60-75	25-35	10-20
199:												
Renohill--------	0-3	Clay loam	CL	A-6	0	0	100	95-100	85 100	65-85	35-40	15-20
	3-24	Clay, clay loam	CH, CL	A-7	0	0	100	90-100	85-100	65-85	45-65	20-40
	24-36	Clay loam	CL, CH	A-6, A-7	0	0	100	85-100	80-95	60-85	40-55	20-35
	36-60	Bedrock			---	---	---	---	---	---	---	---
Savageton-------	0-4	Clay loam	CL, CH	A-7	0	0	100	95-100	85-100	65-85	45-55	20-35
	4-22	Clay, clay loam	CH, CL	A-7	0	0	100	95-100	85-100	70-90	45-65	20-40
	22-36	Clay loam, clay	CH, CL	A-7	0	0	100	90-100	80-100	70-90	45-55	20-40
	36-60	Bedrock			---	---	---	---	---	---	---	---
200:												
Renohill--------	0-3	Clay loam	CL	A-6	0	0	100	95-100	85-100	65-85	35-40	15-20
	3-24	Clay, clay loam	CH, CL	A-7	0	0	100	90-100	85-100	65-85	45-65	20-40
	24-36	Clay loam	CL, CH	A-7, A 6	0	0	100	85-100	80-95	60-85	40-55	20-35
	36-60	Bedrock			---	---	---	---	---	---	---	---
Savageton-------	0-4	Clay loam	CL, CH	A-7	0	0	100	95-100	85-100	65-85	45-55	20-35
	4-22	Clay, clay loam	CH, CL	A-7	0	0	100	95-100	85-100	70-90	45-65	20-40
	22-36	Clay loam, clay	CH, CL	A-7	0	0	100	90-100	80-100	70-90	45-65	20 40
	36-60	Bedrock			---	---	---	---		---	---	---

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
201:												
Renohill--------	0-4	Clay loam	CL	A-6	0	0	100	95-100	85-100	65-85	35-40	15-20
	4 20	Clay, clay loam	CH, CL	A-7	0	0	100	90-100	85-100	65-85	45-65	20-40
	20-30	Clay loam	CL, CH	A-6, A-7	0	0	100	85-100	80-95	60-85	40-55	20-35
	30-60	Bedrock			---	---	---	---	---	---	---	---
Shingle---------	0-1	Loam	CL-ML, CL	A-4, A-6	0	0	95-100	90-100	70-90	60-80	25-35	5-15
	1-12	Loam, clay loam	CL	A-6	0	0	95-100	85-100	70-90	55-80	30-40	10-20
	12-60	Bedrock			---		---	---	---	---	---	---
Worf-----------	0-1	Loam	CL-ML, CL	A-4, A-6	0	0	100	90-100	80-90	50-70	25-35	5-15
	1 10	Clay loam, loam	CL	A-6	0	0	95-100	80-100	75-95	60-80	35-40	15-20
	10-14	Clay loam, loam	CL	A-6	0	0	95-100	80-100	75-95	60-80	25-35	10-15
	14-60	Bedrock			---	---	---	---	---	---	---	---
202:												
Renohill--------	0-4	Clay loam	CL	A-6	0	0	100	95-100	85-100	65-85	35-40	15-20
	4-20	Clay, clay loam	CH, CL	A-7	0	0	100	90-100	85-100	65-85	45-65	20-40
	20-30	Clay loam	CL, CH	A-6, A-7	0	0	100	85-100	80-95	60-85	40-55	20-35
	30-60	Bedrock			---	---	---	---	---	---	---	---
Worfka----------	0-2	Clay loam	CL	A-6	0	0	100	95-100	85-95	60-80	35-40	15-20
	2-13	Clay, clay loam	CH, CL	A-7	0	0	100	95-100	85-95	65-85	45-65	20-40
	13-19	Clay loam	CL, CH	A-6, A-7	0	0	95-100	90-100	80-95	60-80	35-55	15-35
	19-60	Bedrock			---	---		---	---	---	---	---
203:												
Rockypoint------	0-3	Loam	CL	A-6	0	0	100	100	85-100	60-75	25-35	10-15
	3-60	Stratified fine sandy loam to loam	CL	A-6	0	0	100	95-100	80-95	60-75	25-40	10-20
Iwait-----------	0-2	Loam	CL-ML, CL	A-4, A-6	0	0	100	90-100	85-95	55-75	25-35	5-15
	2-60	Clay loam, loam	CL	A-6	0	0	100	90-100	85-95	60-80	30-40	10-20
204:												
Samday----------	0-2	Clay loam	CL	A-6, A-7	0	0	100	100	90-100	70-85	35-55	20-35
	2-16	Clay, clay loam	CH, CL	A-7	0	0	100	90-100	85-100	75-90	45-65	25-40
	16-60	Bedrock			---	---	---	---		---	---	---
Samday, cool----	0-1	Clay loam	CL	A 6, A 7	0	0	100	100	90-100	70-85	35-55	20-35
	1-10	Clay, clay loam	CH, CL	A-7	0	0	100	90-100	85-100	75-90	45-65	25-40
	10 60	Bedrock			---	---	---	---	---	---	---	---

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
204: (cont.)												
Shingle----------	0-3	Clay loam	CL	A-6	0	0	100	100	90-100	70-85	35-45	15-25
	3-16	Clay loam, loam	CL	A-6	0	0	100	90-100	85-100	75-90	30-45	10-25
	16 60	Bedrock			---	---	---	---	---	---	---	---
205:												
Samday-----------	0-2	Clay loam	CL	A-6, A-7	0	0	100	100	90-100	70-85	35-55	20-35
	2-16	Clay, clay loam	CH, CL	A-7	0	0	100	90-100	85-100	75-90	45-65	25-40
	16-60	Bedrock			---	---	---	---	---	---	---	---
Savageton--------	0-5	Clay loam	CL, CH	A-7	0	0	100	95-100	85-100	65-85	45-55	20-35
	5-15	Clay, clay loam	CH, CL	A-7	0	0	100	95 100	85 100	70-90	45-65	20-40
	15-28	Clay, clay loam	CH, CL	A 7	0	0	100	90-100	80-100	70-90	45-65	20-40
	28-60	Bedrock			---	---	---	---	---	---	---	---
206:												
Samday-----------	0-2	Clay loam	CL	A-6, A-7	0	0	100	100	90-100	70-85	35-55	20-35
	2-16	Clay, clay loam	CH, CL	A-7	0	0	100	90-100	85-100	75-90	45-65	25-40
	16-60	Bedrock			---	---	---	---	---	---	---	---
Shingle----------	0-2	Loam	CL	A-6	0	0	100	100	85-100	60-75	25-35	10-15
	2-12	Loam, clay loam	CL	A-6	0	0	100	90-100	75-90	60-75	30-40	10-20
	12-60	Bedrock			---	---	---	---	---	---	---	
Badland----------	0-60	Bedrock			---	---	---	---	---	---	---	---
207:												
Cromack----------	0-6	Clay loam	CL	A-6	0	0	100	100	90-100	70-85	35-55	20-35
	6-14	Clay, clay loam	CH, CL	A-7	0	0	100	100	90-100	80-95	40-65	20-40
	14-29	Clay, clay loam	CH, CL	A-7	0	0	100	95-100	85-100	75-90	35-65	20-40
	29-60	Bedrock			---	---	---	---	---	---	---	---
Fairburn---------	0-4	Loam	CL	A 6	0	0	100	100	85-100	60-75	25-35	10-15
	4-15	Loam, clay loam	CL	A-6	0	0	100	90-100	75-90	60-75	30-40	10-20
	15-60	Bedrock			---	---	---	---	---	---	---	---
Ucross-----------	0-5	Loam	CL	A-6	0	0	100	100	85-100	60-75	25-35	10-15
	5-31	Clay loam, loam	CL	A-6	0	0	100	95-100	80-95	60-75	30-40	10-20
	31-60	Bedrock			---	---	---	---	---	---	---	---

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas-ticity index
	In				Pct	Pct					Pct	
208:												
Savageton-------	0-4	Clay loam	CL, CH	A-7	0	0	100	95-100	85-100	65-85	45-55	20-35
	4-12	Clay, clay loam	CH, CL	A-7	0	0	100	95-100	85-100	70-90	45-65	20-40
	12-38	Clay, clay loam	CH, CL	A-7	0	0	100	90-100	80-100	70-90	45-65	20-40
	38-60	Bedrock			---	---	---	---	---	---	---	---
Silhouette------	0-2	Clay loam	CL	A-6, A-7	0	0	100	100	85-100	65-85	40-55	20-35
	2-28	Clay loam, clay	CL, CH	A-7	0	0	100	95-100	90-100	70-90	45-60	20-40
	28-60	Silty clay loam, clay loam, clay	CL, CH	A-7	0	0	100	95-100	90-100	80-95	45-60	20-40
209:												
Savageton-------	0-3	Clay loam	CL, CH	A-7	0	0	100	95-100	85-100	65-85	45-55	20-35
	3-19	Clay, clay loam	CH, CL	A-7	0	0	100	95-100	85-100	70-90	45-65	20-40
	19-36	Clay, clay loam	CH, CL	A-7	0	0	100	90-100	80-100	70-90	45-65	20-40
	36-60	Bedrock			---	---	---	---	---	---	---	---
Silhouette------	0-3	Clay loam	CL	A-6, A-7	0	0	100	100	85-100	65-85	40-55	20-35
	3-15	Clay loam, clay	CL, CH	A-7	0	0	100	95-100	90-100	70-90	45-60	20-40
	15-60	Clay loam, silty clay loam, clay	CL, CH	A-7	0	0	100	95-100	90-100	80-95	45-60	20-40
210:												
Shingle---------	0-2	Loam	CL	A-6	0	0	100	100	85-100	60-75	25-35	10-15
	2-12	Loam, clay loam	CL	A-6	0	0	100	90-100	75-90	60-75	30-40	10-20
	12-60	Bedrock			---	---	---	---	---	---	---	---
Taluce----------	0-2	Fine sandy loam	SC-SM	A-4	0	0	100	100	85-100	35-50	20-25	5-10
	2-18	Fine sandy loam, sandy loam	SC-SM	A-4	0	0	100	90-100	70-85	35-50	15-25	5-10
	18-60	Bedrock			---	---	---	---	---	---	---	---
211:												
Shingle---------	0-1	Loam	CL-ML, CL	A-4, A-6	0	0	95-100	90-100	70-90	60-80	25-35	5-15
	1-12	Loam, clay loam	CL	A-6	0	0	95-100	85-100	70-90	55-80	30-40	10-20
	12-60	Bedrock			---			---	---	---	---	---
Worf------------	0-1	Loam	CL-ML, CL	A-4, A-6	0	0	100	90-100	80-90	50-70	25-35	5-15
	1-10	Clay loam, loam	CL	A-6	0	0	95-100	80-100	75-95	60-80	35-40	15-20
	10-14	Clay loam, loam	CL	A-6	0	0	95-100	80-100	75-95	60-80	25-35	10-15
	14-60	Bedrock			---	---	---	---	---	---	---	---

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
212:												
Teckla----------	0-10	Very fine sandy loam	SC-SM, CL-ML	A-4	0	0	90-100	90-100	75-95	45-65	20-30	5-10
	10-23	Sandy clay loam, clay loam	CL, SC	A-6	0	0	90-100	90-100	70-95	40-75	30-40	10-20
	23-31	Channery loam, channery clay loam	CL, SC	A-6	0	0	65-85	50-75	40-70	30-55	30-40	10-20
	31-45	Very channery loam, very channery sandy loam	GC, GC-GM, SC, SC-SM	A-1, A-2	0	0-5	30-60	25-55	10-40	5-35	20-35	5-15
	45-60	Very channery sandy loam, extremely channery sandy loam	GC-GM, GP-GM	A-1	0-5	0-15	25-55	10-50	5-30	5-20	0-25	NP-5
213:												
Terro-----------	0-3	Sandy loam	SC-SM	A-2, A-4	0	0	100	95-100	65-75	30-50	20-25	5-10
	3-19	Sandy loam, fine sandy loam	SC-SM	A-2, A-4	0	0	95-100	90-100	55-75	25-45	20-25	5-10
	19-38	Sandy loam, fine sandy loam	SC-SM	A-2, A-4	0	0	95-100	90-100	55-70	20-45	15-25	5-10
	38-60	Bedrock			---	---	---	---	---	---	---	---
Taluce----------	0-2	Sandy loam	SC-SM	A-2, A-4	0	0	95-100	85-100	70-80	30-45	20-25	5-10
	2-14	Sandy loam, fine sandy loam	SC-SM	A-4	0	0	95-100	85-100	65-75	35-50	15-25	5-10
	14-60	Bedrock			---	---	---	---	---	---	---	---
214:												
Theedle---------	0-4	Loam	CL-ML, CL	A-4, A-6	0	0	95-100	95-100	70-90	55-75	25-35	5-15
	4-36	Clay loam, loam	CL	A-6	0	0	90-100	85-100	75-90	60-80	30-40	10-20
	36-60	Bedrock			---	---	---	---	---	---	---	---
Kishona---------	0-4	Loam	CL	A-6	0	0	100	100	85-100	60-75	25-35	10-15
	4-60	Clay loam, loam	CL	A-6	0	0	100	95-100	80-95	60-75	30-40	10-25

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas- ticity index
	In				Pct	Pct					Pct	
215:												
Theedle---------	0-4	Loam	CL-ML, CL	A-4, A-6	0	0	95-100	95-100	70-90	55-75	25-35	5-15
	4-36	Clay loam, loam	CL	A-6	0	0	90-100	85-100	75-90	60-80	30-40	10-20
	36-60	Bedrock			---	---	---	---	---	---	---	---
Kishona---------	0-4	Loam	CL	A-6	0	0	100	100	85-100	60-75	25-35	10-15
	4-60	Clay loam, loam	CL	A-6	0	0	100	95-100	80-95	60-75	30-40	10-25
216:												
Theedle---------	0-2	Loam	CL	A-6	0	0	100	100	85-100	60-75	25-35	10-15
	2-28	Clay loam, loam	CL	A-6	0	0	100	95-100	80-95	60-75	30-40	10-25
	28-60	Bedrock			---	---	---	---	---	---	---	---
Kishona-	0-4	Loam	CL	A-6	0	0	100	100	85-100	60-75	25-35	10-15
	4-60	Clay loam, loam	CL	A-6	0	0	100	95-100	80-95	60-75	30-40	10-25
Shingle---------	0-2	Loam	CL	A-4, A-6	0	0	100	100	85-100	60-75	25-35	5-15
	2-12	Loam, clay loam	CL	A-6	0	0	100	90-100	75-90	60-75	30-40	10-20
	12-60	Bedrock			---	---	---	---	--		---	---
217:												
Theedle---------	0-2	Loam	CL	A 6	0	0	100	100	85-100	60-75	25-35	10-15
	2-28	Clay loam, loam	CL	A-6	0	0	100	95-100	80-95	60-75	30-40	10-25
	28-60	Bedrock			---	---	---	---	---	---	---	---
Shingle---------	0-2	Loam	CL	A-4, A-6	0	0	100	100	85-100	60-75	25-35	5-15
	2-12	Loam, clay loam	CL	A-6	0	0	100	90-100	75-90	60-75	30-40	10-20
	12-60	Bedrock			---	---	---	---	--	---	---	---
218:												
Theedle---------	0-3	Loam	CL-ML, CL	A-4, A-6	0	0	95-100	95-100	70-90	55-75	25-35	5-15
	3-35	Loam, clay loam	CL	A-6	0	0	90-100	85-100	75-90	60-80	30-40	10-20
	35-60	Bedrock			---	---	---	---	---	---	---	---
Turnercrest-----	0-2	Fine sandy loam	SC-SM	A-2, A-4	0	0	100	100	70 80	30-45	15-25	5-10
	2-34	Fine sandy loam, sandy loam	SC-SM	A-2, A-4	0	0	95 100	90-100	70-85	30-50	20-25	5-10
	34-60	Bedrock			---	---	---	---	---	---	---	---
Kishona---------	0-4	Loam	CL-ML, CL	A-4, A-6	0	0	95-100	85-100	70-90	60-80	25-35	5-15
	4-60	Clay loam, loam	CL	A-6	0	0	95-100	85-100	70-90	65-85	30-40	10-20

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
219:												
Torriarents-----	0-4	Variable	CL	A-6	0	0	95-100	90-100	75-95	65-85	30-55	10-35
	4-60	Variable	CL	A-6	0	0	95-100	90-100	75-95	65-85	30-55	10-35
Torriorthents---	0-5	Variable	CL	A-6	0	0	95-100	90-100	75-95	65-85	30-55	10-35
	5-60	Variable.	CL	A-6	0	0	95-100	90-100	75-95	65-85	30-55	10-35
220:												
Pitchdraw-------	0-4	Fine sandy loam	SC-SM	A-4	0	0	100	100	85-100	35-50	15-25	5-10
	4-31	Fine sandy loam, sandy loam	SC-SM	A-4	0	0	100	95-100	75-90	35-50	20-25	5-10
	31-60	Bedrock			---	---	---	---	---	---	---	---
Ashollow--------	0-5	Fine sandy loam	SC-SM	A-4	0	0	100	100	85-100	35-50	15-25	5-10
	5-60	Fine sandy loam, sandy loam	SC-SM	A-4	0	0	100	95-100	75-90	35-50	15 25	5-10
Niobrara--------	0-3	Loamy sand	SM	A-4	0	0	100	100	70-95	35-50	0-15	NP-5
	3-12	Sand, loamy sand	SM	A-2	0	0	100	95-100	55-70	25-40	0-15	NP-5
	12-60	Bedrock			---	---	---	---	---	---	---	---
221:												
Turnercrest-----	0-2	Fine sandy loam	SC-SM	A-4	0	0	100	100	85-100	35-50	15-25	5-10
	2-32	Fine sandy loam, sandy loam	SC-SM	A-4	0	0	100	95 100	75-90	35-50	15-25	5-10
	32-60	Bedrock			---	---	---	---	---	---	---	---
Keeline---------	0-4	Fine sandy loam	SC-SM	A-4	0	0	100	100	85-100	35-50	15-25	5-10
	4-60	Fine sandy loam, sandy loam	SC-SM	A-4	0	0	100	95-100	75-90	30-50	15-25	5-10
Taluce----------	0-2	Fine sandy loam	SM	A-4	0	0	100	100	70-85	40-55	15-25	NP-10
	2-14	Fine sandy loam, sandy loam	SM	A-4	0	0	100	95-100	65-85	35-50	15-25	NP-10
	14-60	Bedrock			---	---	---	---	---	---	---	---

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
222:												
Turnercrest-----	0-3	Loamy sand	SP-SM, SM	A-2	0	0	100	100	70-80	10-25	0-15	NP-5
	3-22	Sandy loam, fine sandy loam	SM	A-2, A-4	0	0	95-100	90-100	70-85	30-50	15-25	NP-5
	22-60	Bedrock			---	---	---	---	---	---	---	---
Wibaux, thin solum---------	0-3	Very channery loam	GC-GM, GC	A-1, A-2	0	0-5	45-60	35-50	30-45	20-35	25-35	5-15
	3-9	Extremely channery loam, very channery loam	GC	A-1, A-2	0-5	0-25	30-55	20-45	15-35	10-30	25-35	5-15
	9-60	Fragmental material	GP	A-1	5-15	60-70	0-10	0-10	0-5	0-5	0-0	NP
Taluce----------	0-2	Sandy loam	SC-SM	A-2, A-4	0	0	95-100	85-100	70-80	30-45	20-25	5-10
	2-14	Sandy loam, fine sandy loam	SC-SM	A-4	0	0	95-100	85-100	65-75	35-50	15-25	5-10
	14-60	Bedrock			---	---		---	---	---	---	---
223:												
Ucross----------	0-5	Loam	CL	A-6	0	0	100	100	85-100	60-75	25-35	10-15
	5-31	Clay loam, loam	CL	A-6	0	0	100	95-100	80-95	60-75	30-40	10-20
	31-60	Bedrock			---	---	---	---	---	---	---	---
224:												
Ucross----------	0-5	Loam	CL	A-6	0	0	100	100	85-100	60-75	25-35	10-15
	5-31	Clay loam, loam	CL	A-6	0	0	100	95-100	80-95	60-75	30-40	10-20
	31-60	Bedrock			---		---	---	---	---	---	---
Iwait-----------	0-6	Loam	CL	A-4, A-6	0	0	100	100	85-100	60-75	25-35	5-15
	6-60	Clay loam, loam	CL	A-6	0	0	100	95-100	80-95	60-75	30-40	15-25
225:												
Ucross----------	0-5	Loam	CL	A-6	0	0	100	100	85-100	60-75	25-35	10-15
	5-31	Clay loam, loam	CL	A-6	0	0	100	95-100	80-95	60-75	30-40	10-20
	31-60	Bedrock			---	---	---	---	---	---	---	---
Iwait-----------	0-6	Loam	CL	A-4, A-6	0	0	100	100	85-100	60-75	25-35	5-15
	6-60	Clay loam, loam	CL	A-6	0	0	100	95-100	80-95	60-75	30-40	15-25

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
225: (cont.)												
Fairburn--------	0-4	Loam	CL	A-6	0	0	100	100	85-100	60-75	25-35	10-15
	4-15	Loam, clay loam	CL	A-6	0	0	100	90-100	75-90	60-75	30-40	10-20
	15-60	Bedrock			---	---	---	---	---	---	---	---
226:												
Ulm------------	0-2	Loam	CL-ML, CL	A-4, A-6	0	0	100	95-100	80 100	60 80	25-35	5-15
	2-25	Clay loam, clay	CH, CL	A-7	0	0	95-100	90-100	80-95	65-85	45-65	20-40
	25-60	Clay loam, loam	CL	A-6, A-7	0	0	95-100	90-100	80-95	60-80	35-55	15-35
227:												
Ulm------------	0-4	Clay loam	CL	A-6	0	0	100	95-100	80-100	60-85	35-40	15-20
	4-25	Clay, clay loam	CH, CL	A-7	0	0	95-100	90-100	80-95	65-85	45-65	20-40
	25-60	Clay loam, loam	CL	A-6, A-7	0	0	95-100	90-100	80-95	60-80	35-55	15-35
228:												
Ulm------------	0-4	Clay loam	CL	A 6	0	0	100	100	90-100	70-85	35-45	15-25
	4-25	Clay, clay loam	CH, CL	A-7	0	0	100	100	90-100	80-95	45-65	25-40
	25-60	Clay loam, clay	CL, CH	A-6, A-7	0	0	100	95-100	85-100	75-90	35-60	20-40
Renohill--------	0-4	Clay loam	CL	A-6	0	0	100	100	90-100	70-85	35-45	15-25
	4-24	Clay, clay loam	CH, CL	A-7	0	0	100	100	90-100	80-95	45-65	25-40
	24-35	Clay loam, clay	CL, CH	A-6, A-7	0	0	100	95-100	85-100	75-90	40-60	20-40
	35-60	Bedrock			---	---	---	---	---	---	---	---
229:												
Ulm----	0 4	Clay loam	CL	A-6	0	0	100	100	90-100	70-85	35-45	15-25
	4-25	Clay, clay loam	CH, CL	A-7	0	0	100	100	90-100	80-95	45-65	25-40
	25-60	Clay loam, clay	CL, CH	A-6, A-7	0	0	100	95-100	85-100	75-90	35-60	20-40
Renohill--------	0-4	Clay loam	CL	A-6	0	0	100	100	90-100	70-85	35-45	15-25
	4-24	Clay, clay loam	CH, CL	A-7	0	0	100	100	90-100	80-95	45-65	25-40
	24-35	Clay loam, clay	CL, CH	A-6, A-7	0	0	100	95-100	85-100	75-90	35-60	15-35
	35-60	Bedrock			---	---	---	---	---	---	---	---
230:												
Urban land------	---	---	---	---	---	---	---	---	---	---	---	---
Deekay----------	0-4	Loam	CL	A-4, A-6	0	0	100	100	85-100	60-75	25-35	5-15
	4-23	Clay loam, loam	CL	A-6	0	0	100	100	90-100	65-80	35-45	15-25
	23-60	Loam, clay loam	CL	A-6	0	0	100	95-100	80-100	60-75	25-35	10-20
Moorhead--------	0-6	Clay loam	CL	A-6	0	0	100	100	85-100	60 80	35 40	15-20
	6-24	Clay, clay loam	CH, CL	A-7	0	0	100	100	85 100	65-85	45-65	20-40
	24-60	Clay loam, clay	CL	A-6	0	0	100	90-100	85-95	60-80	35-60	20-35

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
231:												
Urban land------	---	---	---	---	---	---	---	---	---	---	---	---
Leiter----------	0-3	Clay loam	CL	A-6	0	0	100	100	90-100	70-85	35-45	15-25
	3-22	Clay, clay loam	CH, CL	A-7	0	0	100	100	80-95	80-95	45-65	25-40
	22-33	Clay loam, clay	CL, CH	A-6, A-7	0	0	100	95-100	75-90	75-90	35-60	20-40
	33-60	Bedrock			---	---	---	---	---	---	---	---
Moorhead--------	0-4	Clay loam	CL	A-6	0	0	100	100	90-100	70-85	35-45	15-25
	4-24	Clay, clay loam	CH, CL	A-7	0	0	100	100	90-100	80-95	45-65	25-40
	24-60	Clay loam, clay	CL, CH	A-6, A-7	0	0	100	95-100	85-100	75-90	40-60	20-40
232:												
Urban land------	---	---	---	---	---	---	---	---	---	---	---	---
Pitchdraw-------	0-4	Fine sandy loam	SC-SM	A-4	0	0	100	100	85-100	35-50	15-25	5-10
	4-31	Fine sandy loam, sandy loam	SC-SM	A-4	0	0	100	95-100	75-90	35-50	20-25	5-10
	31-60	Bedrock			---	---	---	---	---	---	---	---
Asholow---------	0-5	Fine sandy loam	SC-SM	A-4	0	0	100	100	85-100	35 50	15-25	5-10
	5-60	Fine sandy loam, sandy loam	SC-SM	A-4	0	0	100	95-100	75-90	35-50	15-25	5-10
233:												
Ustic Torriorthents--	0-4	Loam, clay loam, fine sandy loam	CL	A-4, A-6	0	0	100	95-100	80-95	60-75	25-35	5-20
	4-35	Clay loam, loam, fine sandy loam	CL	A-4, A-6	0	0	100	95-100	80-95	60-75	25-35	5-20
	35-60	Bedrock			---	---	---	---	---	---	---	---
234:												
Ustic Torriorthents--	0-4	Loam, clay loam, fine sandy loam	CL	A-4, A-6	0	0	100	95-100	80-95	60-75	25-35	5-20
	4-35	Clay loam, loam, fine sandy loam	CL	A-4, A-6	0	0	100	95-100	80-95	60-75	25-35	5-20
	35-60	Bedrock			---	---	---	---	---	---	---	-

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
234: (cont.)												
Badland---------	0-60	Bedrock			---	---	---	---		---	---	---
235:												
Vonalee---------	0-3	Fine sandy loam	SC-SM	A-2, A-4	0	0	100	100	70-80	30-45	20-25	5-10
	3-24	Fine sandy loam, sandy loam	SC-SM	A-2, A-4	0	0	100	100	70-80	30-45	20-25	5-10
	24-60	Fine sandy loam, sandy loam	SC-SM	A-2, A-4	0	0	100	95-100	70-80	25-45	15-25	5-10
236:												
Vonalee---------	0-3	Fine sandy loam	SC-SM	A-4	0	0	100	100	85-100	35-50	20-25	5-10
	3-24	Fine sandy loam, sandy loam	SC-SM	A-4	0	0	100	100	85-100	35-50	20-25	5-10
	24-60	Fine sandy loam, sandy loam	SC-SM	A-4	0	0	100	95-100	75-90	35-50	15-25	5-10
Terro - --------	0-3	Fine sandy loam	SC-SM	A-4	0	0	100	100	85-100	35-50	20-25	5-10
	3-16	Fine sandy loam, sandy loam	SC-SM	A-4	0	0	100	100	85-100	35-50	20-25	5-10
	16-30	Fine sandy loam, sandy loam	SC-SM	A-4	0	0	100	90-100	70-90	35-50	15-25	5-10
	30-60	Bedrock			---	---	---	---	---	---	---	---
237:												
Vonalf----------	0-6	Fine sandy loam	SC-SM	A-4	0	0	100	100	85-100	35-50	20-25	5-10
	6-34	Fine sandy loam, sandy loam	SC-SM	A-4	0	0	100	100	85-100	35-50	20-25	5-10
	34-60	Fine sandy loam, sandy loam	SC-SM	A-4	0	0	100	95-100	75-90	35-50	15-25	5-10

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
238:												
Vonalf----------	0-6	Fine sandy loam	SC-SM	A-4	0	0	100	100	85-100	35-50	20-25	5-10
	6-34	Fine sandy loam, sandy loam	SC-SM	A-4	0	0	100	100	85-100	35-50	20-25	5-10
	34-60	Fine sandy loam, sandy loam	SC-SM	A-4	0	0	100	95-100	75-90	35-50	15-25	5-10
Xema------------	0-4	Fine sandy loam	SC-SM	A-4	0	0	100	100	85-100	35-50	20-25	5-10
	4-22	Fine sandy loam, sandy loam	SC-SM	A-4	0	0	100	100	85-100	35-50	20-25	5-10
	22-31	Fine sandy loam, sandy loam	SC-SM	A-4	0	0	100	90-100	70-90	35-50	15-25	5-10
	31-60	Bedrock			---	---	---	---	---	---	---	
239:												
Ironbutte-------	0-4	Channery loam	GC-GM, GC, SC	A-4	0	0-5	65-80	60-75	40-60	35-50	25-35	5-15
	4-12	Very channery loam, extremely channery loam	GC-GM, GC	A-2, A 1	0-5	0-25	30-45	25-40	10-30	5-25	20-35	5-15
	12-60	Fragmental material	GP	A-1	5-15	60-70	0-10	0-10	0-5	0-5	0-0	NP
Fairburn--------	0-4	Loam	CL	A-6	0	0	100	100	85-100	60-75	25-35	10-15
	4-15	Loam, clay loam	CL	A-6	0	0	100	90-100	75-90	60-75	30-40	10-20
	15-60	Bedrock			---	---	---	---	---	---	---	---
Mittenbutte-----	0-3	Fine sandy loam	SC-SM	A-4	0	0	100	100	85-100	35-50	20-25	5-10
	3-16	Fine sandy loam, sandy loam	SC-SM	A-4	0	0	100	90-100	75-90	35-50	15-25	5-10
	16-60	Bedrock			---	---	---	---	---	---	---	---

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
240:												
Wibaux----------	0-3	Channery fine sandy loam	GC-GM, GC, SC-SM, SC	A-2, A-4	0	0-5	60-80	50-70	40-60	20-40	20-30	5-10
	3-16	Very channery loam, extremely channery loam	GC	A-1, A-2	0-5	0-25	30-55	20-45	15-35	5-25	25-35	5-15
	16-60	Fragmental material	GP	A-1	5-15	60-70	0-10	0-10	0-5	0-5	0-0	NP
Wibaux, thin solum----------	0-3	Very channery loam	GC-GM, GC	A-1, A-2	0	0-5	45-60	35-50	30-45	20-35	25-35	5-15
	3-9	Extremely channery loam, very channery loam	GC	A-1, A-2	0-5	0-25	30-55	20-45	15-35	10-30	25-35	5-15
	9-60	Fragmental material	GP	A-1	5-15	60-70	0-10	0-10	0-5	0-5	0-0	NP
241:												
Ironbutte-------	0-4	Channery loam	GC-GM, GC, SC	A-4	0	0-5	65-80	60-75	40-60	35-50	25-35	5-15
	4-12	Very channery loam, extremely channery loam	GC-GM, GC	A-2, A-1	0-5	0-25	30-45	25-40	10-30	5-25	20-35	5-15
	12-60	Fragmental material	GP	A-1	5-15	60-70	0-10	0-10	0-5	0-5	0-0	NP
Ironbutte, thin solum----------	0-2	Channery loam	GC-GM, GC, SC	A-4	0	0-5	65-80	60-75	40-60	35-50	25-35	5-15
	2-10	Very channery loam, extremely channery loam	GC-GM, GC	A-2, A-1	0-5	0-25	30-45	25-40	10-30	5-25	20-35	5-15
	10-60	Fragmental material	GP	A-1	5-15	60-70	0-10	0-10	0-5	0-5	0-0	NP

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
242:												
Ironbutte-------	0-4	Channery loam	GC-GM, GC, SC	A-4	0	0-5	65-80	60-75	40-60	35-50	25-35	5-15
	4-12	Very channery loam, extremely channery loam	GC-GM, GC	A-2, A-1	0-5	0-25	30-45	25-40	10-30	5-25	20-35	5-15
	12-60	Fragmental material	GP	A-1	5-15	60-70	0-10	0-10	0-5	0-5	0-0	NP
Deekay----------	0-4	Loam	CL	A-4, A-6	0	0	100	100	85-100	60-75	25-35	5-15
	4-23	Clay loam, loam	CL	A-6	0	0	100	100	90-100	65-80	35-45	15-25
	23-60	Loam, clay loam	CL	A-6	0	0	100	95-100	80-100	60-75	25-35	10-20
Moorhead--------	0-4	Loam	CL	A 6	0	0	100	100	85-100	60-80	30-35	10-15
	4-26	Clay, clay loam	CH, CL	A-7	0	0	100	100	85 100	65-85	45-65	20-40
	26-60	Clay loam, clay	CL, CH	A-6, A-7	0	0	100	90-100	85-95	60 80	40-60	20 35
243:												
Wibaux, thick solum----------	0-5	Channery fine sandy loam	GC-GM, SC-SM, SC	A-2, A-4	0	0	65-85	50-75	40-60	30-45	20-35	5-15
	5-23	Very channery fine sandy loam, very channery loam, very channery loamy fine sand	GC-GM, GC	A-1, A-2	0-5	0-10	50-70	30-55	25-50	15-40	20-35	5-15
	23-60	Fragmental material	GP	A-1	5-15	60-70	0-10	0-10	0-5	0-5	0-0	NP
Wibaux ------	0-3	Channery fine sandy loam	GM, SM, SC-SM	A-1, A-2, A-4	0	0-5	60-80	50-70	40-60	20-40	15-25	NP-10
	3-16	Extremely channery sandy clay loam, very channery sandy clay loam	GC	A-2	0 5	0 25	30 55	20-45	15-35	5-25	30-35	10-15
	16-60	Fragmental material	GP	A-1	5-15	60-70	0-10	0-10	0-5	0-5	0-0	NP

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
244:												
Muleherder------	0-2	Channery loam	GC-GM, CL	A-4	0	0	70-85	65-80	50-65	45-60	25-35	5-15
	2-16	Channery loam, very channery loam	GC-GM, SC-SM	A-4	0-5	0-10	65-80	60-75	35-50	30-45	20-35	5-10
	16-33	Extremely channery fine sandy loam, very channery fine sandy loam	GC-GM	A-2	0-5	5-15	35-50	20-35	10-25	5-25	15-30	5-10
	33-60	Fragmental material	GP	A-1	5-15	60-70	0-10	0-10	0-5	0-5	0-0	NP
Ironbutte-------	0-4	Channery loam	GC-GM, GC, SC	A-4	0	0-5	65-80	60-75	40-60	35 50	25-35	5-15
	4-12	Very channery loam, extremely channery loam	GC-GM, GC	A-2, A-1	0-5	0-25	30-45	25-40	10-30	5-25	20-35	5-15
	12-60	Fragmental material	GP	A-1	5-15	60-70	0-10	0-10	0-5	0-5	0-0	NP
245:												
Wibaux----------	0-4	Channery loam	GC, GC-GM, SC-SM, SC	A-2, A-4, A-6	0	0-5	60-80	50-70	40-60	25-45	25-35	5-15
	4-12	Very channery loam, extremely channery loam	GC	A-1, A-2	0-5	0-25	30-55	20-45	15-35	10-30	25-35	5-15
	12-60	Fragmental material	GP	A-1	5-15	60-70	0-10	0-10	0-5	0-5	0-0	NP
Shingle---------	0-1	Loam	CL-ML, CL	A-4, A-6	0	0	95-100	90-100	70-90	60-80	25-35	5-15
	1-12	Loam, clay loam	CL	A-6	0	0	95-100	85-100	70-90	55 80	30-40	10-20
	12-60	Bedrock			---	---	-	---	---	---	---	---
Badland---------	0-60	Bedrock			---	---	---	---	---	---	---	---
246:												
Wyarno----------	0-3	Clay loam	CL	A-6	0	0	100	100	90-100	70-85	35-40	15-20
	3-12	Clay, clay loam	CH, CL	A-7	0	0	100	95-100	85-95	65-85	45-65	20-40
	12-60	Clay loam	CL, CH	A-6, A-7	0	0	100	95-100	85-95	65-85	40-55	20-35

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas- ticity index
	In				Pct	Pct					Pct	
246:(cont.)												
Ulm-------------	0-4	Clay loam	CL	A-6	0	0	100	95-100	80-100	60-85	35-40	15-20
	4-25	Clay loam, clay	CH, CL	A-7	0	0	95-100	90-100	80-95	65-85	45-65	20-40
	25-60	Clay loam, loam	CL	A-6, A-7	0	0	95-100	90-100	80-95	60-80	35-55	15-35
247:												
Wyotite---------	0-2	Loam	CL-ML, CL	A-4, A-6	0	0	100	100	85-100	65-85	25-35	5-15
	2-38	Silty clay loam, clay loam	CL	A-6	0	0	100	100	90-100	75-90	35-40	15-20
	38-60	Silt loam, silty clay loam, loam	CL-ML, CL	A-4, A-6	0	0	100	95-100	85-100	70-90	25-35	5-15
Ulm-------------	0-6	Loam	CL	A-6	0	0	100	100	85-100	70-90	30-35	10-15
	6-23	Silty clay, silty clay loam	CH, CL	A-7	0	0	100	100	95-100	85-95	45-65	20-40
	23-60	Silty clay loam	CL	A-6, A-7	0	0	100	100	95-100	80-90	35-55	20-35
248:												
Ziggy-----------	0-5	Loam	CL	A-6	0	0	100	100	85-100	60-75	25-35	10-15
	5-14	Loam, clay loam	CL	A-6	0	0	100	100	90-100	65-80	30-45	10-25
	14-60	Clay loam, loam	CL	A-6	0	0	100	95-100	80-95	60-75	30-45	10-25
Iwait-----------	0-6	Loam	CL	A-4, A-6	0	0	100	100	85-100	60-75	25-35	5-15
	6-60	Clay loam, loam	CL	A-6	0	0	100	95-100	80-95	60-75	30-40	15-25
249:												
Ziggy-----------	0-5	Loam	CL	A-6	0	0	100	100	85-100	60-75	25-35	10-15
	5-14	Loam, clay loam	CL	A-6	0	0	100	100	90-100	65-80	30-45	10-25
	14-60	Clay loam, loam	CL	A-6	0	0	100	95-100	80-95	60-75	30-45	10-25
Iwait-----------	0-6	Loam	CL	A-4, A-6	0	0	100	100	85-100	60-75	25-35	5-15
	6-60	Clay loam, loam	CL	A-6	0	0	100	95-100	80-95	60-75	30-40	15-25
250:												
Ziggy-----------	0-5	Loam	CL	A-6	0	0	100	100	85-100	60-75	25-35	10-15
	5-14	Loam, clay loam	CL	A-6	0	0	100	100	90-100	65-80	30-45	10-25
	14-60	Clay loam, loam	CL	A-6	0	0	100	95-100	80-95	60-75	30-45	10-25

Engineering Index Properties - Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
250: (cont.)												
Ucross----------	0-5	Loam	CL	A-6	0	0	100	100	85-100	60-75	25-35	10-15
	5-31	Clay loam, loam	CL	A-6	0	0	100	95-100	80-95	60-75	30-40	10-20
	31-60	Bedrock			---		-	---	---	---	---	---
Oldwolf -----	0-3	Loam	CL	A-6	0	0	100	100	85-100	60-75	25-35	10-15
	3-21	Clay loam, loam	CL	A-6	0	0	100	100	90-100	65-80	30-45	10-25
	21-32	Loam, clay loam	CL	A-6	0	0	100	95-100	80-95	60-75	30-45	10-25
	32-60	Bedrock			---	---	---	---	---	---	---	---

Physical Properties of the Soils

(The symbol < means less than; > means greater than. Entries under "Erosion factors--T" apply to the entire profile. Entries under "Wind erodibility group" and "Wind erodibility index" apply only to the surface layer. Dashes (--) indicate that data were not available or were not estimated.)

Map symbol and soil name	Depth	Clay	Moist bulk density	Perm	Available water capacity	Shrink-swell potential	Organic matter	Erosion factors Kw	Erosion factors Kf	Erosion factors T	Wind erodi-bility group	Wind erodi-bility index
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
100:												
Aridic Ustorthents, saline	0-2	20-27	1.25-1.35	0.6-2	0.16-0.18	3.0-5.9	1.0-3.0	.32	.32	5	5	56
	2-6	30-40	1.20-1.30	0.2-0.6	0.18-0.20	3.0-5.9	0.5-1.0	.37	.37			
	6-46	25-40	1.25-1.40	0.6-2	0.06-0.09	3.0-5.9	0.5-1.0	.32	.32			
	46-60	20-35	1.30-1.45	0.6-2	0.07-0.10	3.0-5.9	0.0-0.5	.32	.32			
101:												
Arvada, thick surface	0-7	8-18	1.25-1.35	2-6	0.14-0.16	0.0-2.9	1.0-2.0	.28	.28	2	3	86
	7-15	35-40	1.25-1.35	0.2-0.6	0.16-0.18	6.0-8.9	1.0-2.0	.37	.37			
	15-26	35-50	1.20-1.35	0.06-0.2	0.08-0.10	6.0-8.9	0.5-1.0	.43	.43			
	26-60	35-50	1.20-1.35	0.06-0.2	0.08-0.10	6.0-8.9	0.5-1.0	.43	.43			
102:												
Arvada, thick surface	0-7	8-18	1.25-1.35	2-6	0.14-0.16	0.0-2.9	1.0-2.0	.28	.28	2	3	86
	7-15	35-40	1.25-1.35	0.2-0.6	0.16-0.18	6.0-8.9	1.0-2.0	.37	.37			
	15-26	35-50	1.20-1.35	0.06-0.2	0.08-0.10	6.0-8.9	0.5-1.0	.43	.43			
	26-60	35-50	1.20-1.35	0.06-0.2	0.08-0.10	6.0-8.9	0.5-1.0	.43	.43			
Arvada	0-2	12-20	1.25-1.35	2-6	0.13-0.15	0.0-2.9	1.0-2.0	.28	.28	2	3	86
	2-9	35-45	1.20-1.30	0.06-0.2	0.15-0.20	3.0-5.9	0.5-1.0	.37	.37			
	9-15	35-45	1.20-1.30	0.06-0.2	0.09-0.14	6.0-8.9	0.5-1.0	.37	.37			
	15-60	30-45	1.20-1.30	0.2-0.6	0.09-0.14	6.0-8.9	0.5-1.0	.37	.37			
Slickspots	---	---	---	---	---	---	---	---	---	-	---	---
103:												
Arwite	0-5	10-18	1.25-1.35	2-6	0.13-0.15	0.0-2.9	1.0-3.0	.24	.24	5	3	86
	5-32	20-35	1.30-1.40	0.6-2	0.14-0.16	3.0-5.9	0.5-1.0	.32	.32			
	32-60	8-18	1.40-1.50	2-6	0.13-0.15	0.0-2.9	0.0-0.5	.24	.24			
104:												
Arwite	0-5	10-18	1.25-1.35	2-6	0.13-0.15	0.0-2.9	1.0-3.0	.24	.24	5	3	86
	5-32	20-35	1.30-1.40	0.6-2	0.14-0.16	3.0-5.9	0.5-1.0	.32	.32			
	32-60	8-18	1.40-1.50	2-6	0.13-0.15	0.0-2.9	0.0-0.5	.24	.24			
105:												
Arwite	0-5	10-18	1.25-1.35	2-6	0.13-0.15	0.0-2.9	1.0-3.0	.24	.24	5	3	86
	5-32	20-35	1.30-1.40	0.6-2	0.14-0.16	3.0-5.9	0.5-1.0	.32	.32			
	32-60	8-18	1.40-1.50	2-6	0.13-0.15	0.0-2.9	0.0-0.5	.24	.24			
Elwop	0-4	10-18	1.25-1.35	2-6	0.13-0.15	0.0-2.9	1.0-3.0	.24	.24	3	3	86
	4-24	20-35	1.30-1.40	0.6-2	0.14-0.16	3.0-5.9	0.5-1.0	.32	.32			
	24-35	8-18	1.40-1.50	2-6	0.13-0.15	0.0-2.9	0.0-0.5	.24	.24			
	35-60	---	---	0.2-0.6	---	---	---	---	---			
106:												
Arwite	0-5	10-18	1.25-1.35	2-6	0.13-0.15	0.0-2.9	1.0-3.0	.24	.24	5	3	86
	5-32	20-35	1.30-1.40	0.6-2	0.14-0.16	3.0-5.9	0.5-1.0	.32	.32			
	32-60	8-18	1.40-1.50	2-6	0.13-0.15	0.0-2.9	0.0-0.5	.24	.24			
Elwop	0-4	10-18	1.25-1.35	2-6	0.13-0.15	0.0-2.9	1.0-3.0	.24	.24	3	3	86
	4-24	20-35	1.30-1.40	0.6-2	0.14-0.16	3.0-5.9	0.5-1.0	.32	.32			
	24-35	8-18	1.40-1.50	2-6	0.13-0.15	0.0-2.9	0.0-0.5	.24	.24			
	35-60	---	---	0.2-0.6	---	---	---	---	---			

Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Perm	Available water capacity	Shrink-swell potential	Organic matter	Erosion factors Kw	Kf	T	Wind erodi-bility group	Wind erodi-bility index
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
107:												
Arwite	0-5	10-18	1.25-1.35	2-6	0.13-0.15	0.0-2.9	1.0-3.0	.24	.24	5	3	86
	5-32	20-35	1.30-1.40	0.6-2	0.14-0.16	3.0-5.9	0.5-1.0	.32	.32			
	32-60	8-18	1.40-1.50	2-6	0.13-0.15	0.0-2.9	0.0-0.5	.24	.24			
Vonalf	0-6	10-15	1.20-1.30	2-6	0.13-0.15	0.0-2.9	1.0-3.0	.24	.24	5	3	86
	6-34	10-18	1.30-1.40	2-6	0.13-0.15	0.0-2.9	0.5-1.0	.28	.28			
	34-60	8-18	1.40-1.50	2-6	0.13-0.15	0.0-2.9	0.0-0.5	.24	.24			
108:												
Arwite	0-5	10-18	1.25-1.35	2-6	0.13-0.15	0.0-2.9	1.0-3.0	.24	.24	5	3	86
	5-32	20-35	1.30-1.40	0.6-2	0.14-0.16	3.0-5.9	0.5-1.0	.32	.32			
	32-60	8-18	1.40-1.50	2-6	0.13-0.15	0.0-2.9	0.0-0.5	.24	.24			
Vonalf	0-6	10-18	1.20-1.30	2-6	0.13-0.15	0.0-2.9	1.0-3.0	.24	.24	5	3	86
	6-34	10-18	1.30-1.40	2-6	0.13-0.15	0.0-2.9	0.5-1.0	.28	.28			
	34-60	8-18	1.40-1.50	2-6	0.13-0.15	0.0-2.9	0.0-0.5	.24	.24			
109:												
Bidman	0-2	15-27	1.25-1.35	0.2-0.6	0.16-0.18	0.0-2.9	1.0-2.0	.32	.32	5	5	56
	2-28	35-50	1.30-1.40	0.06-0.2	0.15-0.19	6.0-8.9	0.5-2.0	.37	.37			
	28-60	25-40	1.25-1.40	0.2-0.6	0.16-0.19	3.0-5.9	0.0-0.5	.37	.37			
110:												
Bidman, loamy substratum	0-4	15-25	1.20-1.30	0.6-2	0.16-0.18	0.0-2.9	1.0-2.0	.32	.32	5	5	56
	4-25	35-50	1.20-1.35	0.06-0.2	0.16-0.20	6.0-8.9	0.5-1.0	.37	.37			
	25-52	30-40	1.20-1.30	0.2-0.6	0.18-0.20	3.0-5.9	0.0-0.5	.37	.37			
	52-60	15-30	1.25-1.40	0.6-2	0.11-0.15	3.0-5.9	0.0-0.5	.32	.32			
111:												
Bidman	0-2	15-25	1.25-1.35	0.2-0.6	0.16-0.18	0.0-2.9	1.0-2.0	.32	.32	5	5	56
	2-28	35-50	1.30-1.40	0.06-0.2	0.15-0.19	6.0-8.9	0.5-2.0	.37	.37			
	28-60	25-40	1.25-1.40	0.2-0.6	0.16-0.19	3.0-5.9	0.0-0.5	.37	.37			
Parmleed	0-3	15-25	1.15-1.25	0.6-2	0.16-0.18	0.0-2.9	1.0-2.0	.32	.32	3	5	56
	3-21	35-50	1.20-1.30	0.06-0.2	0.16-0.19	6.0-8.9	0.5-1.0	.37	.37			
	21-27	25-40	1.25-1.40	0.2-0.6	0.16-0.19	3.0-5.9	0.0-0.5	.43	.43			
	27-60	---	---	---	---	---	---	---	---			
112:												
Bidman	0-2	15-25	1.25-1.35	0.2-0.6	0.16-0.18	0.0-2.9	1.0-2.0	.32	.32	5	5	56
	2-28	35-50	1.30-1.40	0.06-0.2	0.15-0.19	6.0-8.9	0.5-2.0	.37	.37			
	28-48	25-40	1.25-1.40	0.2-0.6	0.16-0.19	3.0-5.9	0.0-0.5	.37	.37			
Parmleed	0-3	15-25	1.15-1.25	0.6-2	0.16-0.18	0.0-2.9	1.0-2.0	.32	.32	3	5	56
	3-21	35-50	1.20-1.30	0.06-0.2	0.16-0.19	6.0-8.9	0.5-1.0	.37	.37			
	21-27	25-40	1.25-1.40	0.2-0.6	0.16-0.19	3.0-5.9	0.0-0.5	.43	.43			
	27-60	---	---	---	---	---	---	---	---			
113:												
Bidman	0-7	15-25	1.25-1.35	0.2-0.6	0.16-0.18	0.0-2.9	1.0-2.0	.32	.32	5	5	56
	7-36	35-50	1.30-1.40	0.06-0.2	0.15-0.19	6.0-8.9	0.5-2.0	.37	.37			
	36-60	25-40	1.25-1.40	0.2-0.6	0.16-0.19	3.0-5.9	0.0-0.5	.37	.37			
Ulm	0-4	15-25	1.20-1.30	0.6-2	0.16-0.18	0.0-2.9	1.0-2.0	.32	.32	5	5	56
	4-30	30-45	1.20-1.35	0.06-0.2	0.16-0.20	6.0-8.9	0.5-1.0	.37	.37			
	30-60	25-40	1.25-1.35	0.2-0.6	0.17-0.19	3.0-5.9	0.0-0.5	.37	.37			

Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Perm	Available water capacity	Shrink-swell potential	Organic matter	Erosion factors Kw	Erosion factors Kf	Erosion factors T	Wind erodibility group	Wind erodibility index
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
114:												
Bowbac	0-3	10-18	1.35-1.45	2-6	0.11-0.13	0.0-2.9	1.0-2.0	.24	.24	3	3	86
	3-31	20-35	1.25-1.35	0.6-2	0.14-0.16	3.0-5.9	0.5-1.0	.32	.32			
	31-39	8-18	1.30-1.40	2-6	0.11-0.13	0.0-2.9	0.0-0.5	.24	.24			
	39-60	---	---	---	---	---	---	---	---			
Taluce	0-2	10-18	1.25-1.35	2-6	0.12-0.15	0.0-2.9	0.5-1.0	.24	.24	2	3	86
	2-14	8-18	1.35-1.45	2-6	0.12-0.15	0.0-2.9	0.0-0.5	.28	.28			
	14-60	---	---	---	---	---	---	---	---			
Badland	0-60	---	---	0.2-0.6	---	---	---	---	---	1	8	0
115:												
Bowbac	0-3	10-18	1.35-1.45	2-6	0.11-0.13	0.0-2.9	1.0-2.0	.24	.24	3	3	86
	3-31	20-35	1.25-1.35	0.6-2	0.14-0.16	3.0-5.9	0.5-1.0	.32	.32			
	31-39	8-18	1.30-1.40	2-6	0.11-0.13	0.0-2.9	0.0-0.5	.28	.28			
	39-60	---	---	---	---	---	---	---	---			
Worf	0-1	10-18	1.25-1.35	2-6	0.11-0.13	0.0-2.9	1.0-2.0	.24	.24	2	3	86
	1-12	20-35	1.25-1.35	0.6-2	0.14-0.16	3.0-5.9	0.5-1.0	.37	.37			
	12-18	18-30	1.40-1.50	0.6-2	0.14-0.16	3.0-5.9	0.0-0.5	.37	.37			
	18-60	---	---	---	---	---	---	---	---			
116:												
Cambria	0-2	15-25	1.15-1.25	0.6-2	0.16-0.18	0.0-2.9	1.0-2.0	.32	.32	5	5	56
	2-10	25-35	1.25-1.35	0.6-2	0.17-0.20	3.0-5.9	0.5-1.0	.37	.37			
	10-60	20-30	1.25-1.35	0.6-2	0.17-0.19	3.0-5.9	0.0-0.5	.37	.37			
Kishona	0-2	15-25	1.15-1.25	0.6-2	0.16-0.18	0.0-2.9	1.0-2.0	.28	.28	5	5	56
	2-60	20-35	1.25-1.35	0.6-2	0.16-0.19	3.0-5.9	0.0-0.5	.37	.37			
Zigweid	0-2	15-25	1.15-1.25	0.6-2	0.16-0.18	0.0-2.9	1.0-2.0	.32	.32	5	5	56
	2-13	20-35	1.25-1.35	0.6-2	0.17-0.19	3.0-5.9	0.5-1.0	.37	.37			
	13-60	20-35	1.25-1.35	0.6-2	0.17-0.19	3.0-5.9	0.0-0.5	.37	.37			
117:												
Cambria	0-3	15-25	1.15-1.25	0.6-2	0.16-0.18	0.0-2.9	1.0-2.0	.32	.32	5	5	56
	3-12	25-35	1.25-1.35	0.6-2	0.17-0.20	3.0-5.9	0.5-1.0	.37	.37			
	12-60	20-30	1.25-1.35	0.6-2	0.17-0.19	3.0-5.9	0.0-0.5	.37	.37			
Kishona	0-2	15-25	1.15-1.25	0.6-2	0.16-0.18	0.0-2.9	1.0-2.0	.28	.28	5	5	56
	2-60	20-35	1.25-1.35	0.6-2	0.16-0.19	3.0-5.9	0.0-0.5	.37	.37			
Zigweid	0-2	15-25	1.15-1.25	0.6-2	0.16-0.18	0.0-2.9	1.0-2.0	.32	.32	5	5	56
	2-13	20-35	1.25-1.35	0.6-2	0.17-0.19	3.0-5.9	0.5-1.0	.37	.37			
	13-60	20-35	1.25-1.35	0.6-2	0.17-0.19	3.0-5.9	0.0-0.5	.37	.37			
118:												
Clarkelen	0-3	7-16	1.25-1.35	2-6	0.13-0.15	0.0-2.9	1.0-2.0	.24	.24	5	3	86
	3-60	8-18	1.30-1.40	2-6	0.11-0.15	0.0-2.9	0.5-1.0	.28	.28			
Draknab	0-4	7-15	1.40-1.50	2-6	0.11-0.13	0.0-2.9	1.0-2.0	.20	.20	5	3	86
	4-28	3-10	1.40-1.55	6-20	0.08-0.10	0.0-2.9	0.5-1.0	.17	.17			
	28-60	1-8	1.40-1.55	6-20	0.06-0.09	0.0-2.9	0.0-0.5	.17	.17			
119:												
Clarkelen	0-3	7-16	1.25-1.35	2-6	0.13-0.15	0.0-2.9	1.0-2.0	.24	.24	5	3	86
	3-60	8-18	1.30-1.40	2-6	0.11-0.15	0.0-2.9	0.5-1.0	.28	.28			
Embry	0-3	6-15	1.25-1.35	2-6	0.13-0.15	0.0-2.9	1.0-2.0	.28	.28	5	3	86
	3-60	8-16	1.35-1.45	2-6	0.12-0.14	0.0-2.9	0.5-1.0	.28	.28			

Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Perm	Available water capacity	Shrink-swell potential	Organic matter	Erosion factors Kw	Kf	T	Wind erodibility group	Wind erodibility index
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
120:												
Clarkelen-------------	0-3	7-16	1.25-1.35	2-6	0.13-0.15	0.0-2.9	1.0-2.0	.24	.24	5	3	86
	3-60	8-18	1.30-1.40	2-6	0.11-0.15	0.0-2.9	0.5-1.0	.28	.28			
Keeline---------------	0-4	6-16	1.25-1.35	2-6	0.10-0.14	0.0-2.9	1.0-2.0	.24	.24	5	3	86
	4-60	7-16	1.35-1.45	2-6	0.10-0.14	0.0-2.9	0.0-0.5	.28	.28			
121:												
Cushman---------------	0-2	15-25	1.25-1.35	0.6-2	0.16-0.18	0.0-2.9	1.0-2.0	.32	.32	3	5	56
	2-19	20-35	1.25-1.40	0.6-2	0.17-0.19	3.0-5.9	0.5-1.0	.37	.37			
	19-31	20-35	1.25-1.40	0.6-2	0.17-0.19	3.0-5.9	0.0-0.5	.37	.37			
	31-60	---	---	---	---	---	---	---	---			
Cambria---------------	0-2	15-25	1.15-1.25	0.6-2	0.16-0.18	0.0-2.9	1.0-2.0	.32	.32	5	5	56
	2-12	25-35	1.25-1.35	0.6-2	0.17-0.20	3.0-5.9	0.5-1.0	.37	.37			
	12-60	20-30	1.25-1.35	0.6-2	0.17-0.19	3.0-5.9	0.0-0.5	.37	.37			
122:												
Cushman---------------	0-2	15-25	1.15-1.25	0.6-2	0.16-0.18	0.0-2.9	1.0-2.0	.32	.32	3	5	56
	2-23	20-35	1.25-1.35	0.6-2	0.19-0.21	3.0-5.9	0.5-1.0	.37	.37			
	23-30	20-35	1.40-1.50	0.6-2	0.16-0.18	3.0-5.9	0.0-0.5	.37	.37			
	30-60	---	---	0.001-0.06	---	---	---	---	---			
Cambria---------------	0-2	15-25	1.15-1.25	0.6-2	0.16-0.18	0.0-2.9	1.0-2.0	.32	.32	5	5	56
	2-12	20-35	1.25-1.35	0.6-2	0.19-0.21	3.0-5.9	0.5-1.0	.32	.32			
	12-60	20-30	1.35-1.45	0.6-2	0.16-0.18	3.0-5.9	0.0-0.5	.32	.32			
123:												
Cushman---------------	0-3	15-25	1.25-1.35	0.6-2	0.16-0.18	0.0-2.9	1.0-2.0	.32	.32	3	5	56
	3-13	20-35	1.25-1.40	0.6-2	0.17-0.19	3.0-5.9	0.5-1.0	.37	.37			
	13-25	20-35	1.25-1.40	0.6-2	0.17-0.19	3.0-5.9	0.0-0.5	.37	.37			
	25-60	---	---	---	---	---	---	---	---			
Renohill--------------	0-2	20-27	1.20-1.30	0.6-2	0.16-0.18	3.0-5.9	1.0-2.0	.32	.32	3	5	56
	2-14	35-50	1.20-1.35	0.06-0.2	0.16-0.19	6.0-8.9	0.5-1.0	.37	.37			
	14-26	30-40	1.30-1.40	0.2-0.6	0.16-0.19	3.0-5.9	0.0-0.5	.37	.37			
	26-60	---	---	---	---	---	---	---	---			
124:												
Cushman---------------	0-3	15-25	1.25-1.35	0.6-2	0.16-0.18	0.0-2.9	1.0-2.0	.32	.32	3	5	56
	3-13	20-35	1.25-1.40	0.6-2	0.17-0.19	3.0-5.9	0.5-1.0	.37	.37			
	13-25	20-35	1.25-1.40	0.6-2	0.17-0.19	3.0-5.9	0.0-0.5	.37	.37			
	25-60	---	---	---	---	---	---	---	---			
Shingle---------------	0-1	15-25	1.15-1.25	0.6-2	0.16-0.18	0.0-2.9	1.0-2.0	.32	.32	2	5	56
	1-12	20-35	1.25-1.40	0.6-2	0.16-0.20	3.0-5.9	0.0-0.5	.37	.37			
	12-60	---	---	---	---	---	---	---	---			
125:												
Cushman---------------	0-3	15-25	1.25-1.35	0.6-2	0.16-0.18	0.0-2.9	1.0-2.0	.32	.32	3	5	56
	3-13	20-35	1.25-1.40	0.6-2	0.17-0.19	3.0-5.9	0.5-1.0	.37	.37			
	13-25	20-35	1.25-1.40	0.6-2	0.17-0.19	3.0-5.9	0.0-0.5	.37	.37			
	25-60	---	---	---	---	---	---	---	---			
Terro-----------------	0-3	10-18	1.25-1.35	2-6	0.11-0.13	0.0-2.9	1.0-2.0	.24	.24	3	3	86
	3-16	10-18	1.35-1.45	2-6	0.11-0.13	0.0-2.9	0.5-1.0	.28	.28			
	16-23	8-18	1.35-1.45	2-6	0.11-0.13	0.0-2.9	0.0-0.5	.24	.24			
	23-60	---	---	---	---	---	---	---	---			

Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Perm	Available water capacity	Shrink-swell potential	Organic matter	Erosion factors Kw	Kf	T	Wind erodi-bility group	Wind erodi-bility index
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
126:												
Cushman	0-2	15-25	1.25-1.35	0.6-2	0.16-0.18	0.0-2.9	1.0-2.0	.32	.32	3	5	56
	2-23	20-35	1.25-1.40	0.6-2	0.17-0.19	3.0-5.9	0.5-1.0	.37	.37			
	23-30	20-35	1.25-1.40	0.6-2	0.17-0.19	3.0-5.9	0.0-0.5	.37	.37			
	30-60	---	---	---	---	---	---	---	---			
Theedle	0-2	15-25	1.15-1.25	0.6-2	0.16-0.18	0.0-2.9	1.0-2.0	.32	.32	3	4L	86
	2-28	20-35	1.25-1.35	0.6-2	0.16-0.20	3.0-5.9	0.5-1.0	.37	.37			
	28-60	---	---	---	---	---	---	---	---			
127:												
Cushman	0-3	15-25	1.25-1.35	0.6-2	0.16-0.18	0.0-2.9	1.0-2.0	.32	.32	3	5	56
	3-13	20-35	1.25-1.40	0.6-2	0.17-0.19	3.0-5.9	0.5-1.0	.37	.37			
	13-25	20-35	1.25-1.40	0.6-2	0.17-0.19	3.0-5.9	0.0-0.5	.37	.37			
	25-60	---	---	---	---	---	---	---	---			
Theedle	0-2	15-25	1.15-1.25	0.6-2	0.16-0.18	0.0-2.9	1.0-2.0	.32	.32	3	4L	86
	2-28	20-35	1.25-1.35	0.6-2	0.16-0.20	3.0-5.9	0.5-1.0	.37	.37			
	28-60	---	---	---	---	---	---	---	---			
128:												
Cushman	0-5	15-25	1.25-1.35	0.6-2	0.16-0.18	0.0-2.9	1.0-2.0	.32	.32	3	5	56
	5-25	20-35	1.25-1.40	0.6-2	0.17-0.19	3.0-5.9	0.5-1.0	.37	.37			
	25-35	20-35	1.25-1.40	0.6-2	0.17-0.19	3.0-5.9	0.0-0.5	.37	.37			
	35-60	---	---	---	---	---	---	---	---			
Worf	0-2	15-25	1.15-1.25	0.6-2	0.16-0.18	0.0-2.9	1.0-2.0	.32	.32	2	5	56
	2-10	20-35	1.25-1.35	0.6-2	0.15-0.19	3.0-5.9	0.5-1.0	.37	.37			
	10-18	18-30	1.40-1.50	0.6-2	0.14-0.18	3.0-5.9	0.0-0.5	.37	.37			
	18-60	---	---	---	---	---	---	---	---			
129:												
Decolney	0-3	10-18	1.20-1.30	2-6	0.13-0.15	0.0-2.9	1.0-2.0	.28	.28	5	3	86
	3-22	20-35	1.25-1.35	0.6-2	0.14-0.16	3.0-5.9	0.5-1.0	.32	.32			
	22-43	10-18	1.30-1.45	2-6	0.13-0.15	0.0-2.9	0.0-0.5	.28	.28			
	43-60	10-18	1.30-1.45	2-6	0.13-0.15	0.0-2.9	0.0-0.5	.28	.28			
Hiland	0-4	10-18	1.25-1.35	2-6	0.11-0.14	0.0-2.9	1.0-2.0	.24	.24	5	3	86
	4-15	20-35	1.25-1.35	0.6-2	0.14-0.16	3.0-5.9	0.5-1.0	.32	.32			
	15-60	10-18	1.35-1.45	2-6	0.11-0.13	0.0-2.9	0.0-0.5	.24	.24			
130:												
Decolney	0-3	10-18	1.20-1.30	2-6	0.13-0.15	0.0-2.9	1.0-2.0	.28	.28	5	3	86
	3-22	20-35	1.25-1.35	0.6-2	0.14-0.16	3.0-5.9	0.5-1.0	.32	.32			
	22-43	10-18	1.30-1.45	2-6	0.13-0.15	0.0-2.9	0.0-0.5	.28	.28			
	43-60	10-18	1.30-1.45	2-6	0.13-0.15	0.0-2.9	0.0-0.5	.28	.28			
Hiland	0-3	10-18	1.25-1.35	2-6	0.11-0.14	0.0-2.9	1.0-2.0	.24	.24	5	3	86
	3-32	20-35	1.25-1.35	0.6-2	0.14-0.16	3.0-5.9	0.5-1.0	.32	.32			
	32-60	10-18	1.35-1.45	2-6	0.11-0.13	0.0-2.9	0.0-0.5	.24	.24			
131:												
Deekay	0-4	15-25	1.15-1.25	0.6-2	0.16-0.18	0.0-2.9	1.0-3.0	.32	.32	5	5	56
	4-24	20-35	1.25-1.35	0.6-2	0.19-0.21	3.0-5.9	0.5-1.0	.37	.37			
	24-60	20-35	1.40-1.50	0.6-2	0.16-0.18	0.0-2.9	0.0-0.5	.37	.37			
132:												
Deekay	0-4	15-25	1.15-1.25	0.6-2	0.16-0.18	0.0-2.9	1.0-3.0	.32	.32	5	5	56
	4-24	20-35	1.25-1.35	0.6-2	0.19-0.21	3.0-5.9	0.5-1.0	.37	.37			
	24-60	20-35	1.40-1.50	0.6-2	0.16-0.18	0.0-2.9	0.0-0.5	.37	.37			

Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Perm	Available water capacity	Shrink-swell potential	Organic matter	Erosion factors Kw	Kf	T	Wind erodi-bility group	Wind erodi-bility index
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
132:(cont.)												
Moorhead	0-5	20-27	1.25-1.35	0.6-2	0.16-0.18	3.0-5.9	1.0-3.0	.32	.32	5	6	48
	5-35	35-50	1.20-1.30	0.06-0.2	0.15-0.19	6.0-8.9	0.5-1.0	.37	.37			
	35-60	30-42	1.20-1.35	0.2-0.6	0.15-0.19	3.0-5.9	0.0-1.0	.43	.43			
133:												
Deekay	0-4	15-25	1.15-1.25	0.6-2	0.16-0.18	0.0-2.9	1.0-3.0	.32	.32	5	5	56
	4-24	20-35	1.25-1.35	0.6-2	0.19-0.21	3.0-5.9	0.5-1.0	.37	.37			
	24-60	20-35	1.40-1.50	0.6-2	0.16-0.18	0.0-2.9	0.0-0.5	.37	.37			
Moorhead	0-5	20-27	1.25-1.35	0.6-2	0.16-0.18	3.0-5.9	1.0-3.0	.32	.32	5	6	48
	5-35	35-50	1.20-1.30	0.06-0.2	0.15-0.19	6.0-8.9	0.5-1.0	.37	.37			
	35-60	30-42	1.20-1.35	0.2-0.6	0.15-0.19	3.0-5.9	0.0-1.0	.43	.43			
134:												
Deekay	0-4	15-25	1.15-1.25	0.6-2	0.16-0.18	0.0-2.9	1.0-3.0	.32	.32	5	5	56
	4-24	20-35	1.25-1.35	0.6-2	0.19-0.21	3.0-5.9	0.5-1.0	.37	.37			
	24-60	20-35	1.40-1.50	0.6-2	0.16-0.18	0.0-2.9	0.0-0.5	.37	.37			
Oldwolf	0-3	15-25	1.15-1.25	0.6-2	0.16-0.18	0.0-2.9	1.0-3.0	.32	.32	3	5	56
	3-21	20-35	1.25-1.35	0.6-2	0.19-0.21	3.0-5.9	0.5-1.0	.37	.37			
	21-32	20-35	1.40-1.50	0.6-2	0.16-0.18	0.0-2.9	0.0-0.5	.37	.37			
	32-60	---	---	0.001-0.06	---	---	---	---	---			
135:												
Deekay	0-4	15-25	1.15-1.25	0.6-2	0.16-0.18	0.0-2.9	1.0-3.0	.32	.32	5	5	56
	4-24	20-35	1.25-1.35	0.6-2	0.19-0.21	3.0-5.9	0.5-1.0	.37	.37			
	24-60	20-35	1.40-1.50	0.6-2	0.16-0.18	0.0-2.9	0.0-0.5	.37	.37			
Oldwolf	0-3	15-25	1.15-1.25	0.6-2	0.16-0.18	0.0-2.9	1.0-3.0	.32	.32	3	5	56
	3-21	20-35	1.25-1.35	0.6-2	0.19-0.21	3.0-5.9	0.5-1.0	.37	.37			
	21-32	20-35	1.40-1.50	0.6-2	0.16-0.18	0.0-2.9	0.0-0.5	.37	.37			
	32-60	---	---	0.001-0.06	---	---	---	---	---			
136:												
Deekay	0-4	15-25	1.15-1.25	0.6-2	0.16-0.18	0.0-2.9	1.0-3.0	.32	.32	5	5	56
	4-24	20-35	1.25-1.35	0.6-2	0.19-0.21	3.0-5.9	0.5-1.0	.37	.37			
	24-60	20-35	1.40-1.50	0.6-2	0.16-0.18	0.0-2.9	0.0-0.5	.37	.37			
Ziggy	0-5	15-25	1.15-1.25	0.6-2	0.16-0.18	0.0-2.9	1.0-3.0	.32	.32	5	5	56
	5-14	20-35	1.25-1.35	0.6-2	0.16-0.18	0.0-2.9	0.5-1.0	.37	.37			
	14-60	20-35	1.40-1.50	0.6-2	0.19-0.21	3.0-5.9	0.0-0.5	.37	.37			
137:												
Echeta	0-3	30-40	1.15-1.25	0.2-0.6	0.19-0.21	3.0-5.9	1.0-3.0	.32	.32	5	4L	86
	3-15	35-50	1.15-1.25	0.06-0.2	0.14-0.16	6.0-8.9	0.5-1.0	.37	.37			
	15-60	30-50	1.30-1.40	0.06-0.2	0.14-0.16	6.0-8.9	0.0-0.5	.37	.37			
138:												
Echeta	0-3	30-40	1.15-1.25	0.2-0.6	0.19-0.21	3.0-5.9	1.0-3.0	.32	.32	5	4L	86
	3-15	35-50	1.15-1.25	0.06-0.2	0.14-0.16	6.0-8.9	0.5-1.0	.37	.37			
	15-60	30-50	1.30-1.40	0.06-0.2	0.14-0.16	6.0-8.9	0.0-0.5	.37	.37			
Cromack	0-6	30-40	1.15-1.25	0.2-0.6	0.18-0.20	3.0-5.9	1.0-3.0	.32	.32	3	4L	86
	6-14	35-50	1.20-1.30	0.06-0.2	0.14-0.16	6.0-8.9	0.5-1.0	.37	.37			
	14-29	30-50	1.30-1.40	0.06-0.2	0.14-0.16	6.0-8.9	0.0-0.5	.37	.37			
	29-60	---	---	0.001-0.06	---	---	---	---	---			
139:												
Embry	0-4	6-15	1.25-1.35	2-6	0.13-0.15	0.0-2.9	1.0-2.0	.28	.28	5	3	86
	4-60	8-16	1.35-1.45	2-6	0.12-0.14	0.0-2.9	0.5-1.0	.28	.28			

Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Perm	Available water capacity	Shrink-swell potential	Organic matter	Erosion factors Kw	Kf	T	Wind erodi-bility group	Wind erodi-bility index
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
139: (cont.)												
Orpha----------------	0-4	3-8	1.35-1.45	20-20	0.05-0.07	0.0-2.9	1.0-2.0	.15	.15	5	1	220
	4-60	3-8	1.45-1.55	20-20	0.05-0.08	0.0-2.9	0.1-0.5	.20	.20			
140:												
Embry----------------	0-6	6-15	1.25-1.35	2-6	0.13-0.15	0.0-2.9	1.0-2.0	.24	.24	5	3	86
	6-60	8-16	1.35-1.45	2-6	0.12-0.14	0.0-2.9	0.5-1.0	.28	.28			
Taluce---------------	0-4	10-18	1.25-1.35	2-6	0.11-0.13	0.0-2.9	0.5-1.0	.24	.24	2	3	86
	4-16	8-18	1.35-1.50	2-6	0.11-0.13	0.0-2.9	0.0-1.0	.28	.28			
	16-60	---	---	---	---	---	---	---	---			
141:												
Emigha---------------	0-1	15-27	1.15-1.25	0.6-2	0.16-0.18	0.0-2.9	1.0-2.0	.37	.37	5	4L	86
	1-19	28-35	1.15-1.30	0.6-2	0.18-0.20	3.0-5.9	0.5-2.0	.43	.43			
	19-60	20-35	1.20-1.35	0.6-2	0.14-0.19	3.0-5.9	0.0-0.5	.43	.43			
142:												
Emigha, sodic--------	0-3	28-35	1.05-1.15	0.6-2	0.17-0.19	3.0-5.9	1.0-2.0	.43	.43	5	7	38
	3-14	28-35	1.10-1.20	0.6-2	0.17-0.19	3.0-5.9	0.5-1.0	.49	.49			
	14-60	25-35	1.15-1.25	0.2-0.6	0.10-0.13	3.0-5.9	0.0-0.5	.43	.43			
Arvada, thick surface-	0-3	18-27	1.25-1.35	0.6-2	0.16-0.18	0.0-2.9	1.0-2.0	.32	.32	2	5	56
	3-12	35-40	1.25-1.35	0.2-0.6	0.16-0.18	6.0-8.9	1.0-2.0	.37	.37			
	12-30	35-50	1.20-1.35	0.06-0.2	0.08-0.10	6.0-8.9	0.5-1.0	.43	.43			
	30-46	35-50	1.20-1.35	0.06-0.2	0.08-0.10	6.0-8.9	0.5-1.0	.43	.43			
	46-60	35-45	1.20-1.35	0.06-0.2	0.08-0.10	6.0-8.9	0.5-1.0	.43	.43			
143:												
Felix, ponded--------	0-5	55-75	1.15-1.25	0.001-0.06	0.13-0.15	9.0-11.9	1.0-3.0	.20	.20	5	4	86
	5-30	60-80	1.15-1.25	0.001-0.06	0.13-0.15	9.0-11.9	0.5-1.0	.20	.20			
	30-50	60-75	1.20-1.30	0.001-0.06	0.13-0.15	9.0-11.9	0.0-0.5	.20	.20			
	50-60	50-70	1.20-1.30	0.001-0.06	0.14-0.16	9.0-11.9	0.0-0.5	.20	.20			
144:												
Forkwood-------------	0-2	15-25	1.15-1.25	0.6-2	0.16-0.18	0.0-2.9	1.0-2.0	.32	.32	5	5	56
	2-23	20-35	1.25-1.35	0.6-2	0.19-0.21	3.0-5.9	0.5-1.0	.37	.37			
	23-60	20-35	1.40-1.50	0.6-2	0.16-0.18	3.0-5.9	0.0-0.5	.37	.37			
145:												
Forkwood-------------	0-3	15-25	1.25-1.35	0.6-2	0.16-0.18	0.0-2.9	1.0-2.0	.32	.32	5	5	56
	3-14	20-35	1.25-1.40	0.6-2	0.17-0.20	3.0-5.9	0.5-1.0	.37	.37			
	14-60	20-30	1.25-1.40	0.6-2	0.17-0.20	3.0-5.9	0.0-0.5	.37	.37			
Cambria--------------	0-2	15-25	1.15-1.25	0.6-2	0.16-0.18	0.0-2.9	1.0-2.0	.32	.32	5	5	56
	2-12	25-35	1.25-1.35	0.6-2	0.17-0.20	3.0-5.9	0.5-1.0	.37	.37			
	12-60	20-30	1.25-1.35	0.6-2	0.17-0.19	3.0-5.9	0.0-0.5	.37	.37			
146:												
Forkwood-------------	0-2	15-25	1.15-1.25	0.6-2	0.16-0.18	0.0-2.9	1.0-2.0	.32	.32	5	5	56
	2-23	20-35	1.25-1.35	0.6-2	0.19-0.21	3.0-5.9	0.5-1.0	.37	.37			
	23-60	20-35	1.40-1.50	0.6-2	0.16-0.18	3.0-5.9	0.0-0.5	.37	.37			
Cushman--------------	0-2	15-25	1.15-1.25	0.6-2	0.16-0.18	0.0-2.9	1.0-2.0	.32	.32	3	5	56
	2-23	20-35	1.25-1.35	0.6-2	0.19-0.21	3.0-5.9	0.5-1.0	.37	.37			
	23-30	20-35	1.40-1.50	0.6-2	0.16-0.18	3.0-5.9	0.0-0.5	.37	.37			
	30-60	---	---	0.001-0.06	---	---	---	---	---			

Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Perm	Available water capacity	Shrink-swell potential	Organic matter	Erosion factors Kw	Kf	T	Wind erodi-bility group	Wind erodi-bility index
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
147:												
Forkwood--------------	0-2	15-25	1.15-1.25	0.6-2	0.16-0.18	0.0-2.9	1.0-2.0	.32	.32	5	5	56
	2-23	20-35	1.25-1.35	0.6-2	0.19-0.21	3.0-5.9	0.5-1.0	.37	.37			
	23-60	20-35	1.40-1.50	0.6-2	0.16-0.18	3.0-5.9	0.0-0.5	.37	.37			
Cushman---------------	0-2	15-25	1.15-1.25	0.6-2	0.16-0.18	0.0-2.9	1.0-2.0	.32	.32	3	5	56
	2-23	20-35	1.25-1.35	0.6-2	0.19-0.21	3.0-5.9	0.5-1.0	.37	.37			
	23-30	20-35	1.40-1.50	0.6-2	0.16-0.18	3.0-5.9	0.0-0.5	.37	.37			
	30-60	---	---	0.001-0.06	---	---	---	---	---			
148:												
Forkwood--------------	0-2	15-25	1.15-1.25	0.6-2	0.16-0.18	0.0-2.9	1.0-2.0	.32	.32	5	5	56
	2-23	20-35	1.25-1.35	0.6-2	0.19-0.21	3.0-5.9	0.5-1.0	.37	.37			
	23-60	20-35	1.40-1.50	0.6-2	0.16-0.18	3.0-5.9	0.0-0.5	.37	.37			
Ulm-------------------	0-2	15-25	1.15-1.25	0.6-2	0.16-0.18	0.0-2.9	1.0-2.0	.32	.32	5	5	56
	2-22	35-50	1.15-1.25	0.06-0.2	0.14-0.16	6.0-8.9	0.5-1.0	.37	.37			
	22-60	25-40	1.40-1.50	0.2-0.6	0.19-0.21	3.0-5.9	0.0-0.5	.37	.37			
149:												
Forkwood--------------	0-2	15-25	1.15-1.25	0.6-2	0.16-0.18	0.0-2.9	1.0-2.0	.32	.32	5	5	56
	2-23	20-35	1.25-1.35	0.6-2	0.19-0.21	3.0-5.9	0.5-1.0	.37	.37			
	23-60	20-35	1.40-1.50	0.6-2	0.16-0.18	3.0-5.9	0.0-0.5	.37	.37			
Ulm-------------------	0-2	15-25	1.15-1.25	0.6-2	0.16-0.18	0.0-2.9	1.0-2.0	.32	.32	5	5	56
	2-22	35-50	1.15-1.25	0.06-0.2	0.14-0.16	6.0-8.9	0.5-1.0	.37	.37			
	22-60	25-40	1.40-1.50	0.2-0.6	0.19-0.21	3.0-5.9	0.0-0.5	.37	.37			
150:												
Gateson---------------	0-2	---	---	---	---	---	---	---	---	3	2	134
	2-6	2-8	1.40-1.50	2-6	0.07-0.09	0.0-2.9	0.5-1.0	.24	.24			
	6-11	5-25	1.40-1.50	2-6	0.07-0.09	0.0-2.9	0.5-1.0	.24	.24			
	11-30	20-30	1.35-1.45	0.6-2	0.14-0.16	3.0-5.9	0.0-0.5	.32	.32			
	30-60	---	---	---	---	---	---	---	---			
Taluce----------------	0-3	10-18	1.25-1.35	2-6	0.11-0.13	0.0-2.9	0.5-1.0	.24	.24	2	3	86
	3-16	8-18	1.35-1.50	2-6	0.11-0.13	0.0-2.9	0.0-1.0	.28	.28			
	16-60	---	---	---	---	---	---	---	---			
Turnercrest-----------	0-4	4-8	1.35-1.45	6-20	0.08-0.10	0.0-2.9	0.5-1.0	.15	.15	3	2	134
	4-32	10-18	1.35-1.50	2-6	0.11-0.14	0.0-2.9	0.0-0.5	.28	.28			
	32-60	---	---	---	---	---	---	---	---			
151:												
Haverdad--------------	0-4	15-25	1.15-1.25	0.6-2	0.14-0.16	0.0-2.9	1.0-2.0	.32	.32	5	4L	86
	4-60	15-35	1.25-1.35	0.6-2	0.14-0.16	3.0-5.9	0.0-0.5	.37	.37			
152:												
Haverdad--------------	0-3	15-25	1.15-1.25	0.6-2	0.16-0.18	0.0-2.9	1.0-2.0	.32	.32	5	4L	86
	3-60	20-35	1.25-1.40	0.6-2	0.17-0.20	3.0-5.9	0.0-0.5	.32	.32			
Clarkelen-------------	0-4	7-16	1.25-1.35	2-6	0.13-0.15	0.0-2.9	1.0-2.0	.24	.24	5	3	86
	4-60	8-18	1.30-1.40	2-6	0.11-0.15	0.0-2.9	0.5-1.0	.28	.28			
153:												
Haverdad--------------	0-7	28-35	1.10-1.20	0.6-2	0.19-0.21	3.0-5.9	1.0-2.0	.37	.37	5	4L	86
	7-60	20-35	1.25-1.40	0.6-2	0.15-0.20	3.0-5.9	0.0-0.5	.37	.37			
Kishona---------------	0-3	28-35	1.20-1.30	0.6-2	0.17-0.19	3.0-5.9	1.0-2.0	.37	.37	5	4	86
	3-60	20-35	1.25-1.35	0.6-2	0.16-0.19	3.0-5.9	0.0-0.5	.37	.37			

Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Perm	Available water capacity	Shrink-swell potential	Organic matter	Erosion factors Kw	Kf	T	Wind erodi-bility group	Wind erodi-bility index
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
154:												
Heldt-----------------	0-3	30-40	1.15-1.25	0.2-0.6	0.17-0.19	3.0-5.9	1.0-2.0	.37	.37	5	4L	86
	3-25	40-50	1.15-1.30	0.06-0.2	0.14-0.17	6.0-8.9	0.5-1.0	.49	.49			
	25-60	35-45	1.20-1.30	0.06-0.2	0.14-0.18	6.0-8.9	0.0-0.5	.49	.49			
155:												
Heldt, saline---------	0-2	30-40	1.15-1.25	0.2-0.6	0.15-0.17	3.0-5.9	1.0-2.0	.37	.37	5	4L	86
	2-22	35-50	1.15-1.25	0.06-0.2	0.11-0.13	6.0-8.9	0.5-1.0	.37	.37			
	22-60	35-45	1.40-1.50	0.06-0.2	0.11-0.13	6.0-8.9	0.0-0.5	.37	.37			
Bidman, saline--------	0-4	15-25	1.15-1.25	0.6-2	0.15-0.17	0.0-2.9	1.0-2.0	.32	.32	5	5	56
	4-13	35-50	1.20-1.30	0.06-0.2	0.12-0.14	6.0-8.9	0.5-1.0	.37	.37			
	13-60	30-45	1.40-1.50	0.2-0.6	0.13-0.15	3.0-5.9	0.0-0.5	.37	.37			
156:												
Hiland----------------	0-3	10-18	1.25-1.35	2-6	0.11-0.14	0.0-2.9	1.0-2.0	.24	.24	5	3	86
	3-19	20-35	1.25-1.35	0.6-2	0.14-0.16	3.0-5.9	0.5-1.0	.32	.32			
	19-60	10-18	1.35-1.45	2-6	0.11-0.13	0.0-2.9	0.0-0.5	.24	.24			
157:												
Hiland----------------	0-4	10-18	1.25-1.35	2-6	0.11-0.14	0.0-2.9	1.0-2.0	.24	.24	5	3	86
	4-24	20-35	1.25-1.35	0.6-2	0.14-0.16	3.0-5.9	0.5-1.0	.32	.32			
	24-60	10-18	1.35-1.45	2-6	0.11-0.13	0.0-2.9	0.0-0.5	.24	.24			
Bowbac----------------	0-3	10-18	1.35-1.45	2-6	0.11-0.13	0.0-2.9	1.0-2.0	.24	.24	3	3	86
	3-31	20-35	1.25-1.35	0.6-2	0.14-0.16	3.0-5.9	0.5-1.0	.32	.32			
	31-39	8-18	1.30-1.40	2-6	0.11-0.14	0.0-2.9	0.0-0.5	.32	.32			
	39-60	---	---	---	---	---	---	---	---			
158:												
Hiland----------------	0-4	10-18	1.25-1.35	2-6	0.11-0.14	0.0-2.9	1.0-2.0	.24	.24	5	3	86
	4-24	20-35	1.25-1.35	0.6-2	0.14-0.16	3.0-5.9	0.5-1.0	.32	.32			
	24-60	10-18	1.35-1.45	2-6	0.11-0.13	0.0-2.9	0.0-0.5	.24	.24			
Bowbac----------------	0-3	10-18	1.35-1.45	2-6	0.11-0.13	0.0-2.9	1.0-2.0	.24	.24	3	3	86
	3-31	20-35	1.25-1.35	0.6-2	0.14-0.16	3.0-5.9	0.5-1.0	.32	.32			
	31-39	8-18	1.30-1.40	2-6	0.11-0.13	0.0-2.9	0.0-0.5	.32	.32			
	39-60	---	---	---	---	---	---	---	---			
159:												
Hiland----------------	0-3	10-18	1.25-1.35	2-6	0.11-0.15	0.0-2.9	1.0-2.0	.24	.24	5	3	86
	3-23	20-35	1.25-1.35	0.6-2	0.14-0.16	3.0-5.9	0.5-1.0	.32	.32			
	23-60	10-18	1.35-1.45	2-6	0.11-0.15	0.0-2.9	0.0-0.5	.24	.24			
Vonalee---------------	0-5	10-18	1.35-1.45	2-6	0.13-0.15	0.0-2.9	1.0-2.0	.24	.24	5	3	86
	5-16	10-18	1.35-1.45	2-6	0.13-0.15	0.0-2.9	0.5-1.0	.28	.28			
	16-60	8-18	1.45-1.55	2-6	0.13-0.15	0.0-2.9	0.0-0.5	.32	.32			
160:												
Hiland----------------	0-3	10-18	1.25-1.35	2-6	0.11-0.15	0.0-2.9	1.0-2.0	.24	.24	5	3	86
	3-23	20-35	1.25-1.35	0.6-2	0.14-0.16	3.0-5.9	0.5-1.0	.32	.32			
	23-60	10-18	1.35-1.45	2-6	0.11-0.15	0.0-2.9	0.0-0.5	.24	.24			
Vonalee---------------	0-5	10-18	1.35-1.45	2-6	0.13-0.15	0.0-2.9	1.0-2.0	.24	.24	5	3	86
	5-24	10-18	1.35-1.45	2-6	0.13-0.15	0.0-2.9	0.5-1.0	.28	.28			
	24-60	8-18	1.45-1.55	2-6	0.13-0.15	0.0-2.9	0.0-0.5	.32	.32			
161:												
Hilight---------------	0-2	30-40	1.10-1.20	0.2-0.6	0.17-0.19	6.0-8.9	1.0-2.0	.37	.37	2	4	86
	2-14	40-55	1.15-1.30	0.06-0.2	0.14-0.16	9.0-11.9	0.5-1.0	.43	.43			
	14-60	---	---	---	---	---	---	---	---			

Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Perm	Available water capacity	Shrink-swell potential	Organic matter	Erosion factors Kw	Erosion factors Kf	Erosion factors T	Wind erodi-bility group	Wind erodi-bility index
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
161: (cont.)												
Taluce, cool	0-4	10-18	1.25-1.35	2-6	0.11-0.13	0.0-2.9	0.5-1.0	.24	.24	2	3	86
	4-18	8-18	1.35-1.50	2-6	0.11-0.13	0.0-2.9	0.0-1.0	.28	.28			
	18-60	---	---	---	---	---	---	---	---			
Wags	0-4	30-40	1.20-1.30	0.2-0.6	0.17-0.19	3.0-5.9	0.5-2.0	.37	.37	3	4	86
	4-34	40-60	1.10-1.20	0.06-0.2	0.14-0.16	6.0-8.9	0.5-1.0	.43	.43			
	34-60	---	---	---	---	---	---	---	---			
162:												
Lismas	0-3	30-40	1.15-1.25	0.06-0.2	0.18-0.20	6.0-8.9	1.0-3.0	.37	.37	2	4	86
	3-16	40-60	1.30-1.40	0.001-0.06	0.14-0.16	9.0-11.9	0.0-0.5	.37	.37			
	16-60	---	---	0.001-0.06	---	---	---	---	---			
Mittenbutte, cool	0-4	10-18	1.25-1.35	2-6	0.13-0.15	0.0-2.9	1.0-2.0	.28	.28	2	3	86
	4-18	8-18	1.45-1.55	2-6	0.13-0.15	0.0-2.9	0.0-0.5	.24	.24			
	18-60	---	---	0.2-0.6	---	---	---	---	---			
Sabatka	0-3	30-40	1.15-1.25	0.06-0.2	0.19-0.21	6.0-8.9	1.0-2.0	.37	.37	3	4	86
	3-19	35-55	1.20-1.30	0.06-0.2	0.14-0.16	6.0-8.9	0.5-1.0	.37	.37			
	19-30	30-50	1.40-1.50	0.06-0.2	0.14-0.16	6.0-8.9	0.0-0.5	.37	.37			
	30-60	---	---	0.001-0.06	---	---	---	---	---			
163:												
Hilight	0-2	40-55	1.05-1.15	0.06-0.2	0.13-0.15	6.0-8.9	1.0-2.0	.37	.37	2	4	86
	2-12	40-55	1.15-1.30	0.06-0.2	0.14-0.16	6.0-8.9	0.5-1.0	.43	.43			
	12-60	---	---	---	---	---	---	---	---			
Wags	0-1	30-40	1.20-1.30	0.2-0.6	0.13-0.16	3.0-5.9	0.5-2.0	.20	.32	3	8	0
	1-23	40-60	1.10-1.20	0.06-0.2	0.14-0.16	6.0-8.9	0.5-1.0	.43	.43			
	23-60	---	---	---	---	---	---	---	---			
Badland	0-60	---	---	0.001-0.06	---	---	---	---	---	1	8	0
164:												
Lismas	0-3	30-40	1.15-1.25	0.06-0.2	0.18-0.20	6.0-8.9	1.0-3.0	.37	.37	2	4	86
	3-16	40-60	1.30-1.40	0.001-0.06	0.14-0.16	9.0-11.9	0.0-0.5	.37	.37			
	16-60	---	---	0.001-0.06	---	---	---	---	---			
Sabatka	0-3	30-40	1.15-1.25	0.06-0.2	0.19-0.21	6.0-8.9	1.0-2.0	.37	.37	3	8	0
	3-19	35-55	1.20-1.30	0.06-0.2	0.14-0.16	6.0-8.9	0.5-1.0	.37	.37			
	19-30	30-50	1.40-1.50	0.06-0.2	0.14-0.16	6.0-8.9	0.0-0.5	.37	.37			
	30-60	---	---	0.001-0.06	---	---	---	---	---			
Badland	0-60	---	---	0.001-0.06	---	---	---	---	---	1	8	0
165:												
Jayem	0-17	10-18	1.25-1.35	2-6	0.11-0.13	0.0-2.9	2.0-3.0	.24	.24	5	3	86
	17-31	10-18	1.35-1.45	2-6	0.12-0.14	0.0-2.9	0.5-1.0	.24	.24			
	31-60	8-18	1.35-1.45	2-6	0.12-0.14	0.0-2.9	0.0-0.5	.28	.28			
166:												
Jaywest	0-7	15-25	1.15-1.25	0.6-2	0.16-0.18	0.0-2.9	1.0-3.0	.32	.32	5	5	56
	7-36	35-50	1.20-1.30	0.06-0.2	0.14-0.16	6.0-8.9	0.5-1.0	.37	.37			
	36-60	25-40	1.40-1.50	0.2-0.6	0.19-0.21	3.0-5.9	0.0-0.5	.37	.37			
167:												
Jaywest	0-7	15-25	1.15-1.25	0.6-2	0.16-0.18	0.0-2.9	1.0-3.0	.32	.32	5	5	56
	7-36	35-50	1.20-1.30	0.06-0.2	0.14-0.16	6.0-8.9	0.5-1.0	.37	.37			
	36-60	25-40	1.40-1.50	0.2-0.6	0.19-0.21	3.0-5.9	0.0-0.5	.37	.37			

Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Perm	Available water capacity	Shrink-swell potential	Organic matter	Erosion factors Kw	Erosion factors Kf	Erosion factors T	Wind erodibility group	Wind erodibility index
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
167: (cont.)												
Moorhead--------------	0-5	20-27	1.25-1.35	0.6-2	0.16-0.18	3.0-5.9	1.0-3.0	.32	.32	5	6	48
	5-35	35-50	1.20-1.30	0.06-0.2	0.15-0.19	6.0-8.9	0.5-1.0	.37	.37			
	35-60	30-42	1.20-1.35	0.2-0.6	0.15-0.19	3.0-5.9	0.0-1.0	.43	.43			
168:												
Jaywest---------------	0-7	15-25	1.15-1.25	0.6-2	0.16-0.18	0.0-2.9	1.0-3.0	.32	.32	5	5	56
	7-36	35-50	1.20-1.30	0.06-0.2	0.14-0.16	6.0-8.9	0.5-1.0	.37	.37			
	36-60	25-40	1.40-1.50	0.2-0.6	0.19-0.21	3.0-5.9	0.0-0.5	.37	.37			
Spottedhorse----------	0-4	15-25	1.15-1.25	0.6-2	0.16-0.18	0.0-2.9	1.0-3.0	.32	.32	3	5	56
	4-27	35-50	1.20-1.30	0.06-0.2	0.14-0.16	6.0-8.9	0.0-1.0	.37	.37			
	27-35	30-45	1.40-1.50	0.2-0.6	0.19-0.21	6.0-8.9	0.0-0.5	.37	.37			
	35-60	---	---	0.001-0.06	---	---	---	---	---			
169:												
Julesburg-------------	0-10	10-18	1.25-1.35	2-6	0.12-0.14	0.0-2.9	2.0-3.0	.24	.24	5	3	86
	10-32	10-18	1.35-1.45	2-6	0.12-0.14	0.0-2.9	0.5-1.0	.28	.28			
	32-60	8-15	1.35-1.45	2-6	0.12-0.14	0.0-2.9	0.0-0.5	.28	.28			
170:												
Keeline---------------	0-6	2-8	1.35-1.45	6-20	0.06-0.08	0.0-2.9	1.0-2.0	.15	.15	5	2	134
	6-60	7-16	1.40-1.50	2-6	0.11-0.13	0.0-2.9	0.0-0.5	.28	.28			
Tullock---------------	0-4	2-6	1.35-1.45	6-20	0.06-0.08	0.0-2.9	1.0-2.0	.15	.15	3	2	134
	4-28	2-8	1.45-1.55	6-20	0.06-0.08	0.0-2.9	0.0-0.5	.15	.15			
	28-60	---	---	0.2-0.6	---	---	---	---	---			
171:												
Keeline---------------	0-4	6-16	1.25-1.35	2-6	0.10-0.14	0.0-2.9	1.0-2.0	.24	.24	5	3	86
	4-60	7-16	1.35-1.45	2-6	0.10-0.14	0.0-2.9	0.0-0.5	.28	.28			
Tullock---------------	0-4	2-6	1.35-1.45	6-20	0.06-0.08	0.0-2.9	1.0-2.0	.15	.15	3	2	134
	4-22	2-8	1.45-1.60	6-20	0.05-0.08	0.0-2.9	0.0-0.5	.15	.15			
	22-60	---	---	---	---	---	---	---	---			
Niobrara, dry---------	0-3	2-8	1.35-1.45	6-20	0.06-0.08	0.0-2.9	0.5-1.0	.15	.15	2	2	134
	3-12	2-8	1.45-1.60	6-20	0.05-0.07	0.0-2.9	0.0-0.5	.15	.15			
	12-60	---	---	---	---	---	---	---	---			
172:												
Keyner----------------	0-4	10-20	1.25-1.35	2-6	0.13-0.15	0.0-2.9	1.0-2.0	.24	.24	2	3	86
	4-12	20-35	1.30-1.40	0.2-0.6	0.19-0.21	3.0-5.9	0.5-1.0	.37	.37			
	12-20	20-35	1.30-1.40	0.06-0.2	0.11-0.13	3.0-5.9	0.0-0.5	.37	.37			
	20-26	20-35	1.30-1.40	0.06-0.2	0.11-0.13	3.0-5.9	0.0-0.5	.37	.37			
	26-60	15-30	1.30-1.40	0.06-0.2	0.11-0.13	3.0-5.9	0.0-0.5	.37	.37			
173:												
Lawver----------------	0-4	10-25	1.20-1.30	0.6-2	0.16-0.18	0.0-2.9	1.0-3.0	.28	.32	3	5	56
	4-20	35-50	1.20-1.35	0.06-0.2	0.15-0.19	6.0-8.9	0.5-1.0	.28	.37			
	20-27	35-45	1.25-1.40	0.2-0.6	0.15-0.19	6.0-8.9	0.5-1.0	.17	.37			
	27-38	20-35	1.15-1.30	0.6-2	0.12-0.16	3.0-5.9	0.0-0.5	.10	.32			
	38-60	6-15	1.20-1.30	6-20	0.08-0.12	0.0-2.9	0.0-0.5	.05	.28			
Teckla----------------	0-10	10-20	1.25-1.35	2-6	0.15-0.17	0.0-2.9	1.0-2.0	.20	.28	4	3	86
	10-23	20-35	1.25-1.35	0.6-2	0.15-0.19	3.0-5.9	0.5-1.0	.28	.37			
	23-31	20-35	1.20-1.30	0.6-2	0.12-0.16	3.0-5.9	0.5-1.0	.17	.32			
	31-45	10-25	1.15-1.25	2-6	0.06-0.10	0.0-2.9	0.0-1.0	.10	.28			
	45-60	5-15	1.10-1.25	6-20	0.03-0.05	0.0-2.9	0.0-1.0	.05	.28			

Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Perm	Available water capacity	Shrink-swell potential	Organic matter	Erosion factors Kw	Kf	T	Wind erodibility group	Wind erodibility index
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
173: (cont.)												
Wibaux----------------	0-3	15-25	1.10-1.20	2-6	0.09-0.11	0.0-2.9	1.0-2.0	.10	.32	2	8	0
	3-13	10-25	1.10-1.25	2-6	0.05-0.10	0.0-2.9	0.0-0.5	.10	.32			
	13-60	0-2	---	20-20	0.01-0.02	0.0-2.9	0.0-0.0	.02	.02			
174:												
Brislawn--------------	0-6	15-25	1.15-1.25	0.6-2	0.16-0.18	0.0-2.9	1.0-3.0	.32	.32	3	5	56
	6-21	35-50	1.20-1.30	0.06-0.2	0.14-0.16	6.0-8.9	0.5-1.0	.37	.37			
	21-31	30-45	1.25-1.35	0.2-0.6	0.15-0.17	6.0-8.9	0.5-1.0	.24	.37			
	31-37	20-35	1.40-1.50	0.6-2	0.12-0.14	3.0-5.9	0.0-0.5	.15	.37			
	37-60	0-2	---	20-20	0.00-0.02	0.0-2.9	---	.02	.02			
Rockybutte------------	0-5	15-25	1.15-1.25	0.6-2	0.16-0.18	0.0-2.9	1.0-2.0	.32	.32	3	5	56
	5-23	20-35	1.25-1.35	0.2-0.6	0.19-0.21	3.0-5.9	0.5-1.0	.37	.37			
	23-38	20-35	1.40-1.50	2-6	0.05-0.07	0.0-2.9	0.0-0.5	.05	.32			
	38-60	0-2	---	20-20	0.00-0.02	0.0-2.9	0.0-0.0	---	---			
Ironbutte-------------	0-4	15-25	1.15-1.25	0.6-2	0.12-0.14	0.0-2.9	1.0-3.0	.20	.32	2	8	0
	4-12	10-25	1.25-1.35	2-6	0.06-0.08	0.0-2.9	0.5-1.0	.10	.37			
	12-60	0-2	---	20-20	0.00-0.02	0.0-2.9	0.0-0.5	.02	.02			
175:												
Lawver----------------	0-4	10-25	1.20-1.30	0.6-2	0.16-0.18	0.0-2.9	1.0-3.0	.28	.32	3	5	56
	4-20	35-50	1.20-1.35	0.06-0.2	0.15-0.19	6.0-8.9	0.5-1.0	.28	.37			
	20-27	35-45	1.25-1.40	0.2-0.6	0.15-0.19	6.0-8.9	0.5-1.0	.17	.37			
	27-38	20-35	1.15-1.30	0.6-2	0.12-0.16	3.0-5.9	0.0-0.5	.10	.32			
	38-60	6-15	1.20-1.30	6-20	0.08-0.12	0.0-2.9	0.0-0.5	.05	.28			
Wibaux----------------	0-3	15-25	1.10-1.20	2-6	0.09-0.11	0.0-2.9	1.0-2.0	.10	.32	2	8	0
	3-13	10-25	1.10-1.25	2-6	0.05-0.10	0.0-2.9	0.0-0.5	.10	.32			
	13-60	0-2	---	20-20	0.01-0.02	0.0-2.9	0.0-0.0	.02	.02			
176:												
Leiter----------------	0-3	28-35	1.15-1.25	0.2-0.6	0.19-0.21	3.0-5.9	1.0-3.0	.37	.37	3	6	48
	3-22	35-50	1.20-1.30	0.06-0.2	0.14-0.16	6.0-8.9	0.5-1.0	.37	.37			
	22-33	30-45	1.40-1.50	0.2-0.6	0.19-0.21	3.0-5.9	0.0-0.5	.37	.37			
	33-60	---	---	0.001-0.06	---	---	---	---	---			
Cromack---------------	0-6	30-40	1.15-1.25	0.2-0.6	0.18-0.20	3.0-5.9	1.0-3.0	.32	.32	3	4L	86
	6-14	35-50	1.20-1.30	0.06-0.2	0.14-0.16	6.0-8.9	0.5-1.0	.37	.37			
	14-29	30-50	1.30-1.40	0.06-0.2	0.14-0.16	6.0-8.9	0.0-0.5	.37	.37			
	29-60	---	---	0.001-0.06	---	---	---	---	---			
177:												
Maysdorf--------------	0-3	10-18	1.25-1.35	2-6	0.11-0.14	0.0-2.9	1.0-2.0	.24	.24	5	3	86
	3-33	20-35	1.30-1.40	0.6-2	0.14-0.16	3.0-5.9	0.5-1.0	.37	.37			
	33-60	10-18	1.30-1.45	2-6	0.11-0.15	0.0-2.9	0.0-0.5	.32	.32			
178:												
Maysdorf--------------	0-5	20-25	1.15-1.25	0.6-2	0.14-0.16	0.0-2.9	1.0-2.0	.32	.32	5	5	56
	5-26	20-35	1.30-1.40	0.6-2	0.14-0.16	3.0-5.9	0.5-1.0	.37	.37			
	26-60	10-18	1.30-1.45	2-6	0.11-0.15	0.0-2.9	0.0-0.5	.32	.32			
179:												
Maysdorf--------------	0-5	10-18	1.25-1.35	2-6	0.11-0.14	0.0-2.9	1.0-2.0	.24	.24	5	3	86
	5-20	20-35	1.30-1.40	0.6-2	0.14-0.16	3.0-5.9	0.5-1.0	.37	.37			
	20-60	10-18	1.30-1.45	2-6	0.11-0.15	0.0-2.9	0.0-0.5	.32	.32			

Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Perm	Available water capacity	Shrink-swell potential	Organic matter	Erosion factors Kw	Kf	T	Wind erodi-bility group	Wind erodi-bility index
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
179: (cont.)												
Pugsley---------------	0-4	10-18	1.25-1.35	2-6	0.11-0.13	0.0-2.9	1.0-2.0	.24	.24	3	3	86
	4-15	20-30	1.25-1.40	0.6-2	0.14-0.16	3.0-5.9	0.5-1.0	.32	.32			
	15-23	8-18	1.40-1.55	6-20	0.11-0.13	0.0-2.9	0.0-0.5	.28	.28			
	23-60	---	---	---	---	---	---	---	---			
180:												
Maysdorf--------------	0-5	10-18	1.25-1.35	2-6	0.11-0.14	0.0-2.9	1.0-2.0	.24	.24	5	3	86
	5-20	20-35	1.30-1.40	0.6-2	0.14-0.16	3.0-5.9	0.5-1.0	.37	.37			
	20-60	10-18	1.30-1.45	2-6	0.11-0.15	0.0-2.9	0.0-0.5	.32	.32			
Pugsley---------------	0-4	10-18	1.25-1.35	2-6	0.11-0.13	0.0-2.9	1.0-2.0	.24	.24	3	3	86
	4-15	20-30	1.25-1.40	0.6-2	0.14-0.16	3.0-5.9	0.5-1.0	.32	.32			
	15-23	8-18	1.40-1.55	6-20	0.11-0.13	0.0-2.9	0.0-0.5	.28	.28			
	23-60	---	---	---	---	---	---	---	---			
181:												
Moorhead--------------	0-4	28-35	1.15-1.25	0.2-0.6	0.19-0.21	3.0-5.9	1.0-3.0	.37	.37	5	6	48
	4-24	35-50	1.15-1.25	0.06-0.2	0.14-0.16	6.0-8.9	0.5-1.0	.37	.37			
	24-60	30-45	1.40-1.50	0.2-0.6	0.19-0.21	3.0-5.9	0.0-0.5	.37	.37			
182:												
Moorhead--------------	0-3	20-27	1.15-1.25	0.6-2	0.16-0.18	3.0-5.9	1.0-3.0	.32	.32	5	5	56
	3-25	35-45	1.25-1.35	0.2-0.6	0.18-0.20	6.0-8.9	0.5-1.0	.37	.37			
	25-60	30-42	1.40-1.50	0.2-0.6	0.19-0.21	3.0-5.9	0.0-0.5	.37	.37			
183:												
Moorhead--------------	0-4	28-35	1.15-1.25	0.2-0.6	0.19-0.21	3.0-5.9	1.0-3.0	.37	.37	5	6	48
	4-24	35-50	1.15-1.25	0.06-0.2	0.14-0.16	6.0-8.9	0.5-1.0	.37	.37			
	24-60	30-45	1.40-1.50	0.2-0.6	0.19-0.21	3.0-5.9	0.0-0.5	.37	.37			
Leiter----------------	0-3	28-35	1.15-1.25	0.2-0.6	0.19-0.21	3.0-5.9	1.0-3.0	.37	.37	3	6	48
	3-22	35-50	1.20-1.30	0.06-0.2	0.14-0.16	6.0-8.9	0.5-1.0	.37	.37			
	22-33	30-45	1.40-1.50	0.2-0.6	0.19-0.21	3.0-5.9	0.0-0.5	.37	.37			
	33-60	---	---	0.001-0.06	---	---	---	---	---			
184:												
Moorhead--------------	0-4	28-35	1.15-1.25	0.2-0.6	0.19-0.21	3.0-5.9	1.0-3.0	.37	.37	5	6	48
	4-24	35-50	1.15-1.25	0.06-0.2	0.14-0.16	6.0-8.9	0.5-1.0	.37	.37			
	24-60	30-45	1.40-1.50	0.2-0.6	0.19-0.21	3.0-5.9	0.0-0.5	.37	.37			
Leiter----------------	0-3	28-35	1.15-1.25	0.2-0.6	0.19-0.21	3.0-5.9	1.0-3.0	.37	.37	3	6	48
	3-22	35-50	1.20-1.30	0.06-0.2	0.14-0.16	6.0-8.9	0.5-1.0	.37	.37			
	22-33	30-45	1.40-1.50	0.2-0.6	0.19-0.21	3.0-5.9	0.0-0.5	.37	.37			
	33-60	---	---	0.001-0.06	---	---	---	---	---			
185:												
Moskee----------------	0-9	10-18	1.25-1.35	2-6	0.13-0.15	0.0-2.9	2.0-4.0	.24	.24	5	3	86
	9-32	20-35	1.30-1.40	0.6-2	0.14-0.16	3.0-5.9	1.0-2.0	.32	.32			
	32-60	10-18	1.40-1.50	2-6	0.13-0.15	0.0-2.9	0.0-0.5	.24	.24			
186:												
Moskee----------------	0-4	10-18	1.25-1.35	2-6	0.13-0.15	0.0-2.9	2.0-4.0	.24	.24	5	3	86
	4-16	20-35	1.25-1.40	0.6-2	0.14-0.16	3.0-5.9	1.0-2.0	.28	.28			
	16-60	10-18	1.30-1.45	2-6	0.13-0.15	0.0-2.9	0.0-0.5	.32	.32			
187:												
Nuncho----------------	0-12	20-27	1.15-1.25	0.6-2	0.16-0.18	0.0-2.9	2.0-4.0	.32	.32	5	5	56
	12-30	35-45	1.20-1.30	0.06-0.2	0.14-0.16	6.0-8.9	1.0-2.0	.37	.37			
	30-60	28-40	1.40-1.50	0.2-0.6	0.19-0.21	3.0-5.9	0.0-0.5	.37	.37			

Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Perm	Available water capacity	Shrink-swell potential	Organic matter	Erosion factors Kw	Kf	T	Wind erodi-bility group	Wind erodi-bility index
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
188:												
Orpha	0-4	5-9	1.35-1.45	20-20	0.06-0.08	0.0-2.9	1.0-2.0	.17	.17	5	2	134
	4-60	5-9	1.45-1.55	20-20	0.05-0.08	0.0-2.9	0.1-0.5	.20	.20			
Tullock	0-8	2-6	1.35-1.45	6-20	0.06-0.08	0.0-2.9	1.0-2.0	.15	.15	3	2	134
	8-30	2-8	1.45-1.55	6-20	0.06-0.09	0.0-2.9	0.0-0.5	.17	.17			
	30-60	---	---	---	---	---	---	---	---			
189:												
Oshoto	0-7	15-25	1.10-1.25	0.6-2	0.18-0.20	0.0-2.9	1.0-3.0	.37	.37	5	5	56
	7-32	28-35	1.15-1.30	0.6-2	0.19-0.21	3.0-5.9	0.5-1.0	.43	.43			
	32-60	20-35	1.15-1.30	0.6-2	0.19-0.21	3.0-5.9	0.0-0.5	.43	.43			
Moorhead	0-5	20-27	1.25-1.35	0.6-2	0.16-0.18	3.0-5.9	1.0-3.0	.32	.32	5	6	48
	5-35	35-50	1.20-1.30	0.06-0.2	0.15-0.19	6.0-8.9	0.5-1.0	.37	.37			
	35-60	30-42	1.20-1.35	0.2-0.6	0.15-0.19	3.0-5.9	0.0-1.0	.43	.43			
190:												
Parmleed	0-3	15-25	1.15-1.25	0.6-2	0.16-0.18	0.0-2.9	1.0-2.0	.32	.32	3	5	56
	3-21	35-50	1.20-1.30	0.06-0.2	0.16-0.19	6.0-8.9	0.5-1.0	.37	.37			
	21-27	25-40	1.25-1.40	0.2-0.6	0.16-0.19	3.0-5.9	0.0-0.5	.43	.43			
	27-60	---	---	---	---	---	---	---	---			
Renohill	0-4	28-35	1.15-1.25	0.2-0.6	0.18-0.20	3.0-5.9	1.0-2.0	.32	.32	3	6	48
	4-24	35-50	1.20-1.35	0.06-0.2	0.16-0.19	6.0-8.9	0.5-2.0	.37	.37			
	24-35	30-40	1.30-1.40	0.2-0.6	0.16-0.19	3.0-5.9	0.0-0.5	.37	.37			
	35-60	---	---	---	---	---	---	---	---			
191:												
Pits	---	---	---	---	---	---	---	---	---	-	---	---
Dumps	---	---	---	---	---	---	---	---	---	-	---	---
192:												
Platmak	0-4	15-25	1.15-1.25	0.6-2	0.16-0.18	0.0-2.9	2.0-4.0	.32	.32	5	5	56
	4-27	35-50	1.20-1.30	0.06-0.2	0.14-0.16	6.0-8.9	1.0-2.0	.37	.37			
	27-60	30-40	1.40-1.50	0.2-0.6	0.19-0.21	3.0-5.9	0.0-0.5	.37	.37			
193:												
Pugsley	0-3	10-18	1.25-1.35	2-6	0.11-0.13	0.0-2.9	1.0-2.0	.24	.24	3	3	86
	3-13	20-30	1.25-1.40	0.6-2	0.14-0.16	3.0-5.9	0.5-1.0	.32	.32			
	13-25	8-18	1.40-1.55	6-20	0.11-0.13	0.0-2.9	0.0-0.5	.28	.28			
	25-60	---	---	---	---	---	---	---	---			
Decolney	0-3	10-18	1.20-1.30	2-6	0.13-0.15	0.0-2.9	1.0-2.0	.28	.28	5	3	86
	3-22	20-35	1.25-1.35	0.6-2	0.14-0.16	3.0-5.9	0.5-1.0	.32	.32			
	22-43	10-18	1.30-1.45	2-6	0.13-0.15	0.0-2.9	0.0-0.5	.28	.28			
	43-60	10-18	1.30-1.45	2-6	0.13-0.15	0.0-2.9	0.0-0.5	.28	.28			
194:												
Pugsley	0-3	10-18	1.25-1.35	2-6	0.11-0.13	0.0-2.9	1.0-2.0	.24	.24	3	3	86
	3-13	20-30	1.25-1.40	0.6-2	0.14-0.16	3.0-5.9	0.5-1.0	.32	.32			
	13-25	8-18	1.40-1.55	6-20	0.11-0.13	0.0-2.9	0.0-0.5	.28	.28			
	25-60	---	---	---	---	---	---	---	---			
Decolney	0-3	10-18	1.20-1.30	2-6	0.13-0.15	0.0-2.9	1.0-2.0	.28	.28	5	3	86
	3-22	20-35	1.25-1.35	0.6-2	0.14-0.16	3.0-5.9	0.5-1.0	.32	.32			
	22-43	10-18	1.30-1.45	2-6	0.13-0.15	0.0-2.9	0.0-0.5	.28	.28			
	43-60	10-18	1.30-1.45	2-6	0.13-0.15	0.0-2.9	0.0-0.5	.28	.28			

Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Perm	Available water capacity	Shrink-swell potential	Organic matter	Erosion factors Kw	Kf	T	Wind erodibility group	Wind erodibility index
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
195:												
Rauzi	0-3	10-18	1.25-1.35	2-6	0.13-0.15	0.0-2.9	1.0-3.0	.24	.24	5	3	86
	3-30	20-35	1.25-1.35	0.6-2	0.14-0.16	3.0-5.9	0.5-1.0	.32	.32			
	30-60	10-25	1.35-1.45	2-6	0.11-0.15	0.0-2.9	0.0-0.5	.24	.24			
196:												
Rauzi	0-6	20-25	1.25-1.35	0.6-2	0.14-0.16	0.0-2.9	1.0-3.0	.32	.32	5	5	56
	6-30	20-35	1.25-1.35	0.6-2	0.14-0.16	3.0-5.9	0.5-1.0	.32	.32			
	30-60	10-18	1.35-1.45	2-6	0.11-0.15	0.0-2.9	0.0-0.5	.24	.24			
197:												
Rauzi	0-3	10-20	1.25-1.35	2-6	0.12-0.15	0.0-2.9	1.0-3.0	.24	.24	5	3	86
	3-30	20-35	1.25-1.35	0.6-2	0.14-0.16	3.0-5.9	0.5-1.0	.32	.32			
	30-60	10-25	1.35-1.45	2-6	0.11-0.15	0.0-2.9	0.0-0.5	.24	.24			
Elwop	0-4	10-18	1.25-1.35	2-6	0.13-0.15	0.0-2.9	1.0-3.0	.24	.24	3	3	86
	4-24	20-35	1.30-1.40	0.6-2	0.14-0.16	3.0-5.9	0.5-1.0	.32	.32			
	24-35	8-18	1.40-1.50	2-6	0.13-0.15	0.0-2.9	0.0-0.5	.24	.24			
	35-60	---	---	---	---	---	---	---	---			
198:												
Recluse	0-5	15-25	1.15-1.25	0.6-2	0.16-0.18	0.0-2.9	2.0-4.0	.32	32	5	5	56
	5-23	25-35	1.25-1.35	0.6-2	0.19-0.21	3.0-5.9	1.0-2.0	.37	37			
	23-60	15-30	1.40-1.50	0.6-2	0.16-0.19	0.0-2.9	0.0-0.5	.37	.37			
199:												
Renohill	0-3	28-35	1.15-1.25	0.2-0.6	0.18-0.20	3.0-5.9	1.0-2.0	.32	.32	3	6	48
	3-24	35-50	1.20-1.35	0.06-0.2	0.16-0.19	6.0-8.9	0.5-2.0	.37	.37			
	24-36	30-40	1.30-1.40	0.2-0.6	0.16-0.19	3.0-5.9	0.0-0.5	.37	.37			
	36-60	---	---	---	---	---	---	---	---			
Savageton	0-4	35-40	1.15-1.25	0.2-0.6	0.18-0.20	6.0-8.9	1.0-2.0	.32	.32	3	4L	86
	4-22	35-50	1.20-1.35	0.06-0.2	0.15-0.19	6.0-8.9	0.5-1.0	.37	.37			
	22-36	35-50	1.20-1.35	0.06-0.2	0.15-0.19	6.0-8.9	0.5-1.0	.37	.37			
	36-60	---	---	---	---	---	---	---	---			
200:												
Renohill	0-3	28-35	1.15-1.25	0.2-0.6	0.18-0.20	3.0-5.9	1.0-2.0	.32	.32	3	6	48
	3-24	35-50	1.20-1.35	0.06-0.2	0.16-0.19	6.0-8.9	0.5-2.0	.37	.37			
	24-36	30-40	1.30-1.40	0.2-0.6	0.16-0.19	3.0-5.9	0.0-0.5	.37	.37			
	36-60	---	---	---	---	---	---	---	---			
Savageton	0-4	35-40	1.15-1.25	0.2-0.6	0.18-0.20	6.0-8.9	1.0-2.0	.32	.32	3	4L	86
	4-22	35-50	1.20-1.35	0.06-0.2	0.15-0.19	6.0-8.9	0.5-1.0	.37	.37			
	22-36	35-50	1.20-1.35	0.06-0.2	0.15-0.19	6.0-8.9	0.5-1.0	.37	.37			
	36-60	---	---	---	---	---	---	---	---			
201:												
Renohill	0-4	28-35	1.15-1.25	0.2-0.6	0.18-0.20	3.0-5.9	1.0-2.0	.32	.32	3	6	48
	4-20	35-50	1.20-1.35	0.06-0.2	0.16-0.19	6.0-8.9	0.5-2.0	.37	.37			
	20-30	30-40	1.30-1.40	0.2-0.6	0.16-0.19	3.0-5.9	0.0-0.5	.37	.37			
	30-60	---	---	---	---	---	---	---	---			
Shingle	0-1	15-25	1.15-1.25	0.6-2	0.16-0.18	0.0-2.9	1.0-2.0	.32	.32	2	5	56
	1-12	20-35	1.25-1.40	0.6-2	0.16-0.20	3.0-5.9	0.0-0.5	.37	.37			
	12-60	---	---	---	---	---	---	---	---			
Worf	0-1	15-25	1.15-1.25	0.6-2	0.16-0.18	0.0-2.9	1.0-2.0	.32	.32	2	5	56
	1-10	20-35	1.25-1.35	0.6-2	0.15-0.19	3.0-5.9	0.5-1.0	.37	.37			
	10-14	18-30	1.40-1.50	0.6-2	0.14-0.18	3.0-5.9	0.0-0.5	.37	.37			
	14-60	---	---	---	---	---	---	---	---			

Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Perm	Available water capacity	Shrink-swell potential	Organic matter	Erosion factors Kw	Kf	T	Wind erodi-bility group	Wind erodi-bility index
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
202:												
Renohill	0-4	28-35	1.15-1.25	0.2-0.6	0.18-0.20	3.0-5.9	1.0-2.0	.32	.32	3	6	48
	4-20	35-50	1.20-1.35	0.06-0.2	0.16-0.19	6.0-8.9	0.5-2.0	.37	.37			
	20-30	30-40	1.30-1.40	0.2-0.6	0.16-0.19	3.0-5.9	0.0-0.5	.37	.37			
	30-60	---	---	---	---	---	---	---	---			
Worfka	0-2	28-35	1.25-1.35	0.6-2	0.18-0.20	3.0-5.9	1.0-2.0	.37	.37	2	6	48
	2-13	35-50	1.25-1.35	0.06-0.2	0.15-0.19	6.0-8.9	0.5-1.0	.43	.43			
	13-19	28-40	1.30-1.40	0.6-2	0.16-0.18	3.0-5.9	0.0-0.5	.37	.37			
	19-60	---	---	---	---	---	---	---	---			
203:												
Rockypoint	0-3	15-25	1.15-1.25	0.6-2	0.16-0.18	0.0-2.9	1.0-3.0	.32	.32	5	4L	86
	3-60	15-35	1.40-1.50	0.6-2	0.16-0.18	3.0-5.9	0.0-0.5	.37	.37			
Iwait	0-2	15-25	1.30-1.40	0.6-2	0.16-0.18	0.0-2.9	1.0-3.0	.32	.32	5	4L	86
	2-60	20-35	1.25-1.40	0.6-2	0.16-0.20	3.0-5.9	0.0-1.0	.37	.37			
204:												
Samday	0-2	30-40	1.20-1.30	0.2-0.6	0.18-0.20	3.0-5.9	1.0-2.0	.32	.32	2	4L	86
	2-16	35-50	1.30-1.40	0.06-0.2	0.14-0.16	6.0-8.9	0.0-0.5	.37	.37			
	16-60	---	---	0.001-0.06	---	---	---	---	---			
Samday, cool	0-1	30-40	1.20-1.30	0.2-0.6	0.18-0.20	3.0-5.9	1.0-2.0	.32	.32	2	4L	86
	1-10	35-50	1.30-1.40	0.06-0.2	0.14-0.16	6.0-8.9	0.0-0.5	.37	.37			
	10-60	---	---	0.001-0.06	---	---	---	---	---			
Shingle	0-3	28-35	1.15-1.25	0.6-2	0.19-0.21	3.0-5.9	1.0-2.0	.32	.32	2	6	48
	3-16	20-35	1.40-1.50	0.6-2	0.19-0.21	3.0-5.9	0.0-0.5	.37	.37			
	16-60	---	---	0.001-0.06	---	---	---	---	---			
205:												
Samday	0-2	30-40	1.20-1.30	0.2-0.6	0.18-0.20	3.0-5.9	1.0-2.0	.32	.32	2	4L	86
	2-16	35-50	1.30-1.40	0.06-0.2	0.14-0.16	6.0-8.9	0.0-0.5	.37	.37			
	16-60	---	---	---	---	---	---	---	---			
Savageton	0-5	35-40	1.15-1.25	0.2-0.6	0.18-0.20	3.0-5.9	1.0-2.0	.32	.32	3	4L	86
	5-15	35-50	1.20-1.35	0.06-0.2	0.15-0.19	6.0-8.9	0.5-1.0	.37	.37			
	15-28	35-50	1.20-1.35	0.06-0.2	0.15-0.19	6.0-8.9	0.5-1.0	.37	.37			
	28-60	---	---	---	---	---	---	---	---			
206:												
Samday	0-2	30-40	1.20-1.30	0.2-0.6	0.18-0.20	3.0-5.9	1.0-2.0	.32	.32	2	6	48
	2-16	35-50	1.30-1.40	0.06-0.2	0.14-0.16	6.0-8.9	0.0-0.5	.37	.37			
	16-60	---	---	0.001-0.06	---	---	---	---	---			
Shingle	0-2	15-25	1.15-1.25	0.6-2	0.16-0.18	0.0-2.9	1.0-2.0	.32	.32	2	5	56
	2-12	20-35	1.40-1.50	0.6-2	0.16-0.18	3.0-5.9	0.0-0.5	.32	.32			
	12-60	---	---	0.001-0.06	---	---	---	---	---			
Badland	0-60	---	---	0.001-0.06	---	---	---	---	---	1	8	0
207:												
Cromack	0-6	30-40	1.15-1.25	0.2-0.6	0.18-0.20	3.0-5.9	1.0-3.0	.32	.32	3	4L	86
	6-14	35-50	1.20-1.30	0.06-0.2	0.14-0.16	6.0-8.9	0.5-1.0	.37	.37			
	14-29	30-50	1.30-1.40	0.06-0.2	0.14-0.16	6.0-8.9	0.0-0.5	.37	.37			
	29-60	---	---	0.001-0.06	---	---	---	---	---			
Fairburn	0-4	15-25	1.15-1.25	0.6-2	0.16-0.18	0.0-2.9	1.0-3.0	.32	.32	2	4L	86
	4-15	20-35	1.40-1.50	0.6-2	0.16-0.18	3.0-5.9	0.0-0.5	.37	.37			
	15-60	---	---	0.001-0.06	---	---	---	---	---			

Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Perm	Available water capacity	Shrink-swell potential	Organic matter	Erosion factors			Wind erodi-bility group	Wind erodi-bility index
								Kw	Kf	T		
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
207: (cont.)												
Ucross	0-5	15-25	1.15-1.25	0.6-2	0.16-0.18	0.0-2.9	1.0-3.0	.32	.32	3	4L	86
	5-31	20-35	1.40-1.50	0.6-2	0.19-0.21	3.0-5.9	0.0-0.5	.37	.37			
	31-60	---	---	0.001-0.06	---	---	---	---	---			
208:												
Savageton	0-4	35-40	1.15-1.25	0.2-0.6	0.18-0.20	6.0-8.9	1.0-2.0	.32	.32	3	4L	86
	4-12	35-50	1.20-1.35	0.06-0.2	0.15-0.19	6.0-8.9	0.5-1.0	.37	.37			
	12-38	35-50	1.20-1.35	0.06-0.2	0.15-0.19	6.0-8.9	0.5-1.0	.37	.37			
	38-60	---	---	---	---	---	---	---	---			
Silhouette	0-2	30-40	1.15-1.25	0.2-0.6	0.16-0.19	3.0-5.9	1.0-2.0	.37	.37	5	4L	86
	2-28	35-45	1.20-1.30	0.2-0.6	0.16-0.19	6.0-8.9	0.5-1.0	.43	.43			
	28-60	35-45	1.30-1.40	0.2-0.6	0.16-0.19	6.0-8.9	0.0-0.5	.49	.49			
209:												
Savageton	0-3	35-40	1.15-1.25	0.2-0.6	0.18-0.20	6.0-8.9	1.0-2.0	.32	.32	3	4L	86
	3-19	35-50	1.20-1.35	0.06-0.2	0.15-0.19	6.0-8.9	0.5-1.0	.37	.37			
	19-36	35-50	1.20-1.35	0.06-0.2	0.15-0.19	6.0-8.9	0.5-1.0	.37	.37			
	36-60	---	---	---	---	---	---	---	---			
Silhouette	0-3	30-40	1.15-1.25	0.2-0.6	0.16-0.19	3.0-5.9	1.0-2.0	.37	.37	5	4L	86
	3-15	35-45	1.20-1.30	0.2-0.6	0.16-0.19	6.0-8.9	0.5-1.0	.43	.43			
	15-60	35-45	1.30-1.40	0.2-0.6	0.16-0.19	6.0-8.9	0.0-0.5	.49	.49			
210:												
Shingle	0-2	15-25	1.15-1.25	0.6-2	0.16-0.18	0.0-2.9	1.0-2.0	.32	.32	2	5	56
	2-12	20-35	1.40-1.50	0.6-2	0.16-0.18	3.0-5.9	0.0-0.5	.37	.37			
	12-60	---	---	0.001-0.06	---	---	---	---	---			
Taluce	0-2	10-18	1.25-1.35	6-20	0.13-0.15	0.0-2.9	0.5-1.0	.28	.28	2	3	86
	2-18	8-18	1.45-1.55	6-20	0.13-0.15	0.0-2.9	0.0-0.5	.32	.32			
	18-60	---	---	0.2-0.6	---	---	---	---	---			
211:												
Shingle	0-1	15-25	1.15-1.25	0.6-2	0.16-0.18	0.0-2.9	1.0-2.0	.32	.32	2	5	56
	1-12	20-35	1.25-1.40	0.6-2	0.16-0.20	3.0-5.9	0.0-0.5	.37	.37			
	12-60	---	---	---	---	---	---	---	---			
Worf	0-1	15-25	1.15-1.25	0.6-2	0.16-0.18	0.0-2.9	1.0-2.0	.32	.32	2	5	56
	1-10	20-35	1.25-1.35	0.6-2	0.15-0.19	3.0-5.9	0.5-1.0	.37	.37			
	10-14	18-30	1.40-1.50	0.6-2	0.14-0.18	3.0-5.9	0.0-0.5	.37	.37			
	14-60	---	---	---	---	---	---	---	---			
212:												
Teckla	0-10	10-20	1.25-1.35	2-6	0.15-0.17	0.0-2.9	1.0-2.0	.20	.28	4	3	86
	10-23	20-35	1.25-1.35	0.6-2	0.15-0.19	3.0-5.9	0.5-1.0	.28	.37			
	23-31	20-35	1.20-1.30	0.6-2	0.12-0.16	3.0-5.9	0.5-1.0	.17	.32			
	31-45	10-25	1.15-1.25	2-6	0.06-0.10	0.0-2.9	0.0-1.0	.10	.28			
	45-60	5-15	1.10-1.25	6-20	0.03-0.05	0.0-2.9	0.0-1.0	.05	.28			
213:												
Terro	0-3	10-18	1.25-1.35	2-6	0.11-0.13	0.0-2.9	1.0-2.0	.24	.24	3	3	86
	3-19	10-18	1.35-1.45	2-6	0.11-0.13	0.0-2.9	0.5-1.0	.28	.28			
	19-38	8-18	1.40-1.55	2-6	0.11-0.13	0.0-2.9	0.0-0.5	.24	.24			
	38-60	---	---	---	---	---	---	---	---			
Taluce	0-2	10-18	1.25-1.35	6-20	0.12-0.15	0.0-2.9	0.5-1.0	.28	.28	2	3	86
	2-14	8-18	1.35-1.45	6-20	0.12-0.14	0.0-2.9	0.0-0.5	.32	.32			
	14-60	---	---	---	---	---	---	---	---			

Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Perm	Available water capacity	Shrink-swell potential	Organic matter	Erosion factors Kw	Kf	T	Wind erodi-bility group	Wind erodi-bility index
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
214:												
Theedle	0-4	15-25	1.15-1.25	0.6-2	0.16-0.18	0.0-2.9	1.0-2.0	.32	.32	3	4L	86
	4-36	20-35	1.25-1.35	0.6-2	0.16-0.20	3.0-5.9	0.5-1.0	.37	.37			
	36-60	---	---	---	---	---	---	---	---			
Kishona	0-4	15-25	1.15-1.25	0.6-2	0.16-0.18	0.0-2.9	1.0-2.0	.32	.32	5	4L	86
	4-60	20-35	1.40-1.50	0.6-2	0.19-0.21	3.0-5.9	0.0-0.5	.37	.37			
215:												
Theedle	0-4	15-25	1.15-1.25	0.6-2	0.16-0.18	0.0-2.9	1.0-2.0	.32	.32	3	4L	86
	4-36	20-35	1.25-1.35	0.6-2	0.16-0.20	3.0-5.9	0.5-1.0	.37	.37			
	36-60	---	---	0.001-0.06	---	---	---	---	---			
Kishona	0-4	15-25	1.15-1.25	0.6-2	0.16-0.18	0.0-2.9	1.0-2.0	.32	.32	5	4L	86
	4-60	20-35	1.40-1.50	0.6-2	0.19-0.21	3.0-5.9	0.0-0.5	.37	.37			
216:												
Theedle	0-2	15-25	1.15-1.25	0.6-2	0.16-0.18	0.0-2.9	1.0-2.0	.32	.32	3	4L	86
	2-28	20-35	1.40-1.50	0.6-2	0.19-0.21	3.0-5.9	0.0-0.5	.37	.37			
	28-60	---	---	0.001-0.06	---	---	---	---	---			
Kishona	0-4	15-25	1.15-1.25	0.6-2	0.16-0.18	0.0-2.9	1.0-2.0	.32	.32	5	4L	86
	4-60	20-35	1.40-1.50	0.6-2	0.19-0.21	3.0-5.9	0.0-0.5	.37	.37			
Shingle	0-2	15-25	1.15-1.25	0.6-2	0.16-0.18	0.0-2.9	1.0-2.0	.32	.32	2	5	56
	2-12	20-35	1.40-1.50	0.6-2	0.16-0.18	3.0-5.9	0.0-0.5	.37	.37			
	12-60	---	---	0.001-0.06	---	---	---	---	---			
217:												
Theedle	0-2	15-25	1.15-1.25	0.6-2	0.16-0.18	0.0-2.9	1.0-2.0	.32	.32	3	4L	86
	2-28	20-35	1.40-1.50	0.6-2	0.19-0.21	3.0-5.9	0.0-0.5	.37	.37			
	28-60	---	---	0.001-0.06	---	---	---	---	---			
Shingle	0-2	15-25	1.15-1.25	0.6-2	0.16-0.18	0.0-2.9	1.0-2.0	.32	.32	2	5	56
	2-12	20-35	1.40-1.50	0.6-2	0.16-0.18	3.0-5.9	0.0-0.5	.37	.37			
	12-60	---	---	0.001-0.06	---	---	---	---	---			
218:												
Theedle	0-3	15-25	1.15-1.25	0.6-2	0.16-0.18	0.0-2.9	1.0-2.0	.32	.32	3	4L	86
	3-35	20-35	1.25-1.35	0.6-2	0.16-0.20	3.0-5.9	0.5-1.0	.37	.37			
	35-60	---	---	---	---	---	---	---	---			
Turnercrest	0-2	8-15	1.30-1.40	2-6	0.11-0.13	0.0-2.9	1.0-2.0	.20	.20	3	3	86
	2-34	10-18	1.35-1.50	2-6	0.12-0.14	0.0-2.9	0.0-0.5	.28	.28			
	34-60	---	---	---	---	---	---	---	---			
Kishona	0-4	15-25	1.15-1.25	0.6-2	0.16-0.18	0.0-2.9	1.0-2.0	.28	.28	5	5	56
	4-60	20-35	1.25-1.35	0.6-2	0.16-0.19	3.0-5.9	0.0-0.5	.37	.37			
219:												
Torriarents	0-4	20-40	1.25-1.35	0.2-0.6	0.15-0.19	3.0-5.9	0.0-1.0	.37	.37	5	4L	86
	4-60	20-40	1.40-1.50	0.2-0.6	0.15-0.19	3.0-5.9	0.0-0.5	.43	.43			
Torriorthents	0-5	20-40	1.25-1.35	0.2-0.6	0.15-0.19	3.0-5.9	0.0-1.0	.37	.37	5	4L	86
	5-60	20-40	1.40-1.50	0.2-0.6	0.15-0.19	3.0-5.9	0.0-0.5	.43	.43			
220:												
Pitchdraw	0-4	8-15	1.20-1.30	2-6	0.13-0.15	0.0-2.9	1.0-2.0	.24	.24	3	3	86
	4-31	10-18	1.40-1.50	2-6	0.13-0.15	0.0-2.9	0.0-0.5	.28	.28			
	31-60	---	---	0.2-0.6	---	---	---	---	---			

Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Perm	Available water capacity	Shrink-swell potential	Organic matter	Erosion factors Kw	Kf	T	Wind erodibility group	Wind erodibility index
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
220: (cont.)												
Ashollow--------------	0-5	8-18	1.25-1.35	2-6	0.13-0.15	0.0-2.9	1.0-3.0	.24	.24	5	3	86
	5-60	8-18	1.40-1.50	2-6	0.13-0.15	0.0-2.9	0.0-0.5	.28	.28			
Niobrara--------------	0-3	2-8	1.35-1.45	6-20	0.06-0.08	0.0-2.9	0.5-1.0	.20	.20	2	2	134
	3-12	2-8	1.45-1.55	6-20	0.04-0.06	0.0-2.9	0.0-0.5	.20	.20			
	12-60	---	---	0.2-0.6	---	---	---	---	---			
221:												
Turnercrest-----------	0-2	8-18	1.20-1.30	2-6	0.13-0.15	0.0-2.9	1.0-2.0	.24	.24	3	3	86
	2-32	8-18	1.45-1.55	2-6	0.13-0.15	0.0-2.9	0.0-0.5	.28	.28			
	32-60	---	---	0.2-0.6	---	---	---	---	---			
Keeline---------------	0-4	8-18	1.20-1.30	2-6	0.13-0.15	0.0-2.9	1.0-2.0	.24	.24	5	3	86
	4-60	8-18	1.45-1.55	2-6	0.13-0.15	0.0-2.9	0.0-0.5	.28	.28			
Taluce----------------	0-2	8-18	1.25-1.35	6-20	0.13-0.15	0.0-2.9	1.0-2.0	.28	.28	2	3	86
	2-14	10-18	1.25-1.35	6-20	0.13-0.15	0.0-2.9	0.0-1.0	.32	.32			
	14-60	---	---	0.2-0.6	---	---	---	---	---			
222:												
Turnercrest-----------	0-3	4-8	1.45-1.55	6-20	0.06-0.08	0.0-2.9	1.0-2.0	.15	.15	3	2	134
	3-22	10-18	1.35-1.50	2-6	0.12-0.14	0.0-2.9	0.0-0.5	.28	.28			
	22-60	---	---	---	---	---	---	---	---			
Wibaux, thin solum----	0-3	15-25	1.10-1.20	2-6	0.09-0.11	0.0-2.9	1.0-2.0	.15	.32	1	8	0
	3-9	15-25	1.10-1.25	2-6	0.05-0.10	0.0-2.9	0.0-0.5	.05	.32			
	9-60	0-2	---	20-20	0.01-0.02	0.0-2.9	0.0-0.0	.02	.02			
Taluce----------------	0-2	10-18	1.25-1.35	6-20	0.12-0.15	0.0-2.9	0.5-1.0	.28	.28	2	3	86
	2-14	8-18	1.35-1.45	6-20	0.12-0.14	0.0-2.9	0.0-0.5	.32	.32			
	14-60	---	---	---	---	---	---	---	---			
223:												
Ucross----------------	0-5	15-25	1.15-1.25	0.6-2	0.16-0.18	0.0-2.9	1.0-3.0	.32	.32	3	4L	86
	5-31	20-35	1.40-1.50	0.6-2	0.19-0.21	3.0-5.9	0.0-0.5	.37	.37			
	31-60	---	---	0.001-0.06	---	---	---	---	---			
224:												
Ucross----------------	0-5	15-25	1.15-1.25	0.6-2	0.16-0.18	0.0-2.9	1.0-3.0	.32	.32	3	4L	86
	5-31	20-35	1.40-1.50	0.6-2	0.19-0.21	3.0-5.9	0.0-0.5	.37	.37			
	31-60	---	---	0.001-0.06	---	---	---	---	---			
Iwait-----------------	0-6	15-25	1.15-1.25	0.6-2	0.16-0.18	0.0-2.9	1.0-3.0	.32	.32	5	4L	86
	6-60	20-35	1.40-1.50	0.6-2	0.19-0.21	3.0-5.9	0.0-0.5	.37	.37			
225:												
Ucross----------------	0-5	15-25	1.15-1.25	0.6-2	0.16-0.18	0.0-2.9	1.0-3.0	.32	.32	3	4L	86
	5-31	20-35	1.40-1.50	0.6-2	0.19-0.21	3.0-5.9	0.0-0.5	.37	.37			
	31-60	---	---	0.001-0.06	---	---	---	---	---			
Iwait-----------------	0-6	15-25	1.15-1.25	0.6-2	0.16-0.18	0.0-2.9	1.0-3.0	.32	.32	5	4L	86
	6-60	20-35	1.40-1.50	0.6-2	0.19-0.21	3.0-5.9	0.0-0.5	.37	.37			
Fairburn--------------	0-4	15-25	1.15-1.25	0.6-2	0.16-0.18	0.0-2.9	1.0-3.0	.32	.32	2	4L	86
	4-15	20-35	1.40-1.50	0.6-2	0.16-0.18	3.0-5.9	0.0-0.5	.37	.37			
	15-60	---	---	0.001-0.06	---	---	---	---	---			

Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Perm	Available water capacity	Shrink-swell potential	Organic matter	Erosion factors			Wind erodi-bility group	Wind erodi-bility index
								Kw	Kf	T		
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
226:												
Ulm	0-2	15-25	1.20-1.30	0.6-2	0.16-0.18	0.0-2.9	1.0-3.0	.32	.32	5	5	56
	2-25	35-50	1.20-1.35	0.06-0.2	0.16-0.20	6.0-8.9	0.5-1.0	.37	.37			
	25-60	25-40	1.25-1.35	0.2-0.6	0.17-0.19	3.0-5.9	0.0-0.5	.37	.37			
227:												
Ulm	0-4	28-35	1.15-1.25	0.2-0.6	0.18-0.20	3.0-5.9	1.0-2.0	.37	.37	5	6	48
	4-25	35-50	1.20-1.35	0.06-0.2	0.16-0.20	6.0-8.9	0.5-1.0	.37	.37			
	25-60	25-40	1.25-1.35	0.2-0.6	0.17-0.19	3.0-5.9	0.0-0.5	.37	.37			
228:												
Ulm	0-4	28-35	1.15-1.25	0.2-0.6	0.19-0.21	3.0-5.9	1.0-2.0	.32	.32	5	6	48
	4-25	35-50	1.20-1.30	0.06-0.2	0.14-0.16	6.0-8.9	0.5-1.0	.37	.37			
	25-60	30-45	1.40-1.50	0.2-0.6	0.19-0.21	3.0-5.9	0.0-0.5	.37	.37			
Renohill	0-4	28-35	1.15-1.25	0.2-0.6	0.19-0.21	3.0-5.9	1.0-2.0	.37	.37	3	6	48
	4-24	35-50	1.20-1.30	0.06-0.2	0.14-0.16	6.0-8.9	0.5-1.0	.37	.37			
	24-35	30-45	1.40-1.50	0.2-0.6	0.19-0.21	3.0-5.9	0.0-0.5	.37	.37			
	35-60	---	---	0.001-0.06	---	---	---	---	---			
229:												
Ulm	0-4	28-35	1.15-1.25	0.2-0.6	0.19-0.21	3.0-5.9	1.0-2.0	.37	.37	5	6	48
	4-25	35-50	1.20-1.30	0.06-0.2	0.14-0.16	6.0-8.9	0.5-1.0	.37	.37			
	25-60	30-45	1.40-1.50	0.2-0.6	0.19-0.21	3.0-5.9	0.0-0.5	.37	.37			
Renohill	0-4	28-35	1.15-1.25	0.2-0.6	0.19-0.21	3.0-5.9	1.0-2.0	.37	.37	3	6	48
	4-24	35-50	1.20-1.30	0.06-0.2	0.14-0.16	6.0-8.9	0.5-1.0	.37	.37			
	24-35	28-45	1.30-1.40	0.2-0.6	0.19-0.21	3.0-5.9	0.0-0.5	.37	.37			
	35-60	---	---	0.001-0.06	---	---	---	---	---			
230:												
Urban land	---	---	---	---	---	---	---	---	---	-	---	---
Deekay	0-4	15-25	1.15-1.25	0.6-2	0.16-0.18	0.0-2.9	1.0-3.0	.32	.32	5	5	56
	4-23	25-35	1.25-1.35	0.6-2	0.19-0.21	3.0-5.9	0.5-1.0	.37	.37			
	23-60	20-30	1.40-1.50	0.6-2	0.16-0.18	0.0-2.9	0.0-0.5	.37	.37			
Moorhead	0-6	28-35	1.20-1.30	0.2-0.6	0.18-0.20	3.0-5.9	1.0-3.0	.37	.37	5	6	48
	6-24	35-50	1.20-1.30	0.06-0.2	0.15-0.19	6.0-8.9	0.5-1.0	.37	.37			
	24-60	30-42	1.20-1.35	0.2-0.6	0.15-0.19	3.0-5.9	0.0-0.5	.43	.43			
231:												
Urban land	---	---	---	---	---	---	---	---	---	-	---	---
Leiter	0-3	28-35	1.15-1.25	0.2-0.6	0.19-0.21	3.0-5.9	1.0-3.0	.37	.37	3	6	48
	3-22	35-50	1.20-1.30	0.06-0.2	0.14-0.16	6.0-8.9	0.5-1.0	.37	.37			
	22-33	28-45	1.40-1.50	0.2-0.6	0.19-0.21	3.0-5.9	0.0-0.5	.37	.37			
	33-60	---	---	---	---	---	---	---	---			
Moorhead	0-4	28-35	1.15-1.25	0.2-0.6	0.19-0.21	3.0-5.9	1.0-3.0	.37	.37	5	6	48
	4-24	35-50	1.20-1.30	0.06-0.2	0.14-0.16	6.0-8.9	0.5-1.0	.37	.37			
	24-60	30-45	1.40-1.50	0.2-0.6	0.19-0.21	3.0-5.9	0.0-0.5	.37	.37			
232:												
Urban land	---	---	---	---	---	---	---	---	---	-	---	---
Pitchdraw	0-4	8-15	1.20-1.30	2-6	0.13-0.15	0.0-2.9	1.0-2.0	.24	.24	3	3	86
	4-31	10-18	1.40-1.50	2-6	0.13-0.15	0.0-2.9	0.0-0.5	.28	.28			
	31-60	---	---	---	---	---	---	---	---			

Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Perm	Available water capacity	Shrink-swell potential	Organic matter	Erosion factors Kw	Kf	T	Wind erodi-bility group	Wind erodi-bility index
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
232:(cont.)												
Ashollow	0-5	8-18	1.25-1.35	2-6	0.13-0.15	0.0-2.9	1.0-3.0	.24	.24	5	3	86
	5-60	6-18	1.40-1.50	2-6	0.13-0.15	0.0-2.9	0.0-0.5	.28	.28			
233:												
Ustic Torriorthents	0-4	15-30	1.25-1.35	0.6-2	0.16-0.18	0.0-2.9	0.5-1.0	.32	.32	3	4L	86
	4-35	15-30	1.25-1.35	0.6-2	0.16-0.18	0.0-2.9	0.0-0.5	.32	.32			
	35-60	---	---	0.001-0.06	---	---	---	---	---			
234:												
Ustic Torriorthents	0-4	15-30	1.25-1.35	0.6-2	0.16-0.18	0.0-2.9	0.5-1.0	.32	.32	3	4L	86
	4-35	15-30	1.25-1.35	0.6-2	0.16-0.18	0.0-2.9	0.0-0.5	.32	.32			
	35-60	---	---	0.001-0.06	---	---	---	---	---			
Badland	0-60	---	---	0.001-0.06	---	---	---	---	---	1	8	0
235:												
Vonalee	0-3	10-18	1.35-1.45	2-6	0.13-0.15	0.0-2.9	1.0-2.0	.24	.24	5	3	86
	3-24	10-18	1.35-1.45	2-6	0.13-0.15	0.0-2.9	0.5-1.0	.28	.28			
	24-60	8-18	1.45-1.55	2-6	0.13-0.15	0.0-2.9	0.0-0.5	.32	.32			
236:												
Vonalee	0-3	10-18	1.20-1.30	2-6	0.13-0.15	0.0-2.9	1.0-2.0	.24	.24	5	3	86
	3-24	10-18	1.30-1.40	2-6	0.13-0.15	0.0-2.9	0.5-1.0	.28	.28			
	24-60	8-18	1.40-1.50	2-6	0.13-0.15	0.0-2.9	0.0-0.5	.24	.24			
Terro	0-3	10-18	1.20-1.30	2-6	0.13-0.15	0.0-2.9	1.0-2.0	.24	.24	3	3	86
	3-16	10-18	1.30-1.40	2-6	0.13-0.15	0.0-2.9	0.5-1.0	.28	.28			
	16-30	8-18	1.40-1.50	2-6	0.13-0.15	0.0-2.9	0.0-0.5	.24	.24			
	30-60	---	---	0.2-0.6	---	---	---	---	---			
237:												
Vonalf	0-6	10-18	1.20-1.30	2-6	0.13-0.15	0.0-2.9	1.0-3.0	.24	.24	5	3	86
	6-34	10-18	1.30-1.40	2-6	0.13-0.15	0.0-2.9	0.5-1.0	.28	.28			
	34-60	8-18	1.40-1.50	2-6	0.13-0.15	0.0-2.9	0.0-0.5	.24	.24			
238:												
Vonalf	0-6	10-18	1.20-1.30	2-6	0.13-0.15	0.0-2.9	1.0-3.0	.24	.24	5	3	86
	6-34	10-18	1.30-1.40	2-6	0.13-0.15	0.0-2.9	0.5-1.0	.28	.28			
	34-60	8-18	1.40-1.50	2-6	0.13-0.15	0.0-2.9	0.0-0.5	.24	.24			
Xema	0-4	10-18	1.20-1.30	2-6	0.13-0.15	0.0-2.9	1.0-2.0	.24	.24	3	3	86
	4-22	10-18	1.30-1.40	2-6	0.13-0.15	0.0-2.9	0.5-1.0	.28	.28			
	22-31	8-18	1.40-1.50	2-6	0.13-0.15	0.0-2.9	0.0-0.5	.24	.24			
	31-60	---	---	0.2-0.6	---	---	---	---	---			
239:												
Ironbutte	0-4	15-25	1.15-1.25	0.6-2	0.12-0.14	0.0-2.9	1.0-3.0	.20	.32	2	8	0
	4-12	10-25	1.25-1.35	2-6	0.06-0.08	0.0-2.9	0.5-1.0	.10	.37			
	12-60	0-2	---	20-20	0.00-0.02	0.0-2.9	0.0-0.5	.02	.02			
Fairburn	0-4	15-25	1.15-1.25	0.6-2	0.16-0.18	0.0-2.9	1.0-3.0	.32	.32	2	4L	86
	4-15	20-35	1.40-1.50	0.6-2	0.16-0.18	3.0-5.9	0.0-0.5	.37	.37			
	15-60	---	---	0.001-0.06	---	---	---	---	---			
Mittenbutte	0-3	10-18	1.25-1.35	2-6	0.13-0.15	0.0-2.9	1.0-2.0	.28	.28	2	3	86
	3-16	8-18	1.45-1.55	2-6	0.13-0.15	0.0-2.9	0.0-0.5	.24	.24			
	16-60	---	---	0.2-0.6	---	---	---	---	---			

Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Perm	Available water capacity	Shrink-swell potential	Organic matter	Erosion factors Kw	Kf	T	Wind erodi-bility group	Wind erodi-bility index
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
240:												
Wibaux----------------	0-3	10-20	1.10-1.20	2-6	0.09-0.11	0.0-2.9	1.0-2.0	.15	.28	2	8	0
	3-16	15-25	1.10-1.25	2-6	0.05-0.10	0.0-2.9	0.0-0.5	.05	.32			
	16-60	0-2	---	20-20	0.01-0.02	0.0-2.9	0.0-0.0	.02	.02			
Wibaux, thin solum----	0-3	15-25	1.10-1.20	2-6	0.09-0.11	0.0-2.9	1.0-2.0	.15	.32	1	8	0
	3-9	15-25	1.10-1.25	2-6	0.05-0.10	0.0-2.9	0.0-0.5	.05	.32			
	9-60	0-2	---	20-20	0.01-0.02	0.0-2.9	0.0-0.0	.02	.02			
241:												
Ironbutte-------------	0-4	15-25	1.15-1.25	0.6-2	0.12-0.14	0.0-2.9	1.0-3.0	.20	.32	2	8	0
	4-12	10-25	1.25-1.35	2-6	0.06-0.08	0.0-2.9	0.5-1.0	.10	.37			
	12-60	0-2	---	20-20	0.00-0.02	0.0-2.9	0.0-0.5	.02	.02			
Ironbutte, thin solum-	0-2	15-25	1.15-1.25	0.6-2	0.12-0.14	0.0-2.9	1.0-3.0	.20	.32	1	8	0
	2-10	10-25	1.25-1.35	2-6	0.06-0.08	0.0-2.9	0.5-1.0	.10	.37			
	10-60	0-2	---	20-20	0.00-0.02	0.0-2.9	0.0-0.5	.02	.02			
242:												
Ironbutte-------------	0-4	15-25	1.15-1.25	0.6-2	0.12-0.14	0.0-2.9	1.0-3.0	.20	.32	2	8	0
	4-12	10-25	1.25-1.35	2-6	0.06-0.08	0.0-2.9	0.5-1.0	.10	.37			
	12-60	0-2	---	20-20	0.00-0.02	0.0-2.9	0.0-0.5	.02	.02			
Deekay----------------	0-4	15-25	1.15-1.25	0.6-2	0.16-0.18	0.0-2.9	1.0-3.0	.32	.32	5	5	56
	4-23	25-35	1.25-1.35	0.6-2	0.19-0.21	3.0-5.9	0.5-1.0	.37	.37			
	23-60	20-30	1.40-1.50	0.6-2	0.16-0.18	0.0-2.9	0.0-0.5	.37	.37			
Moorhead--------------	0-4	20-27	1.25-1.35	0.6-2	0.16-0.18	3.0-5.9	1.0-3.0	.32	.32	5	6	48
	4-26	35-50	1.20-1.30	0.06-0.2	0.15-0.19	6.0-8.9	0.5-1.0	.37	.37			
	26-60	30-42	1.20-1.35	0.2-0.6	0.15-0.19	3.0-5.9	0.0-0.5	.43	.43			
243:												
Wibaux, thick solum---	0-5	10-25	1.15-1.30	2-6	0.10-0.14	0.0-2.9	1.0-2.0	.20	.32	3	8	0
	5-23	10-25	1.15-1.30	6-20	0.05-0.08	0.0-2.9	0.0-0.5	.10	.32			
	23-60	0-2	---	20-20	0.01-0.02	0.0-2.9	0.0-0.0	.02	.02			
Wibaux----------------	0-3	10-20	1.15-1.25	2-6	0.09-0.11	0.0-2.9	1.0-2.0	.15	.32	2	8	0
	3-16	20-30	1.10-1.25	2-6	0.05-0.10	0.0-2.9	0.0-0.5	.05	.32			
	16-60	0-2	---	20-20	0.01-0.02	0.0-2.9	0.0-0.0	.02	.02			
244:												
Muleherder------------	0-2	15-25	1.15-1.25	0.6-2	0.14-0.16	0.0-2.9	1.0-2.0	.20	.32	3	8	0
	2-16	10-25	1.25-1.35	0.6-2	0.12-0.14	0.0-2.9	0.5-1.0	.20	.32			
	16-33	8-20	1.45-1.55	6-20	0.05-0.07	0.0-2.9	0.0-0.5	.05	.28			
	33-60	0-2	---	20-20	0.00-0.02	0.0-2.9	0.0-0.0	.02	.02			
Ironbutte-------------	0-4	15-25	1.15-1.25	0.6-2	0.12-0.14	0.0-2.9	1.0-3.0	.20	.32	2	8	0
	4-12	10-25	1.25-1.35	2-6	0.06-0.08	0.0-2.9	0.5-1.0	.10	.37			
	12-60	0-2	---	20-20	0.00-0.02	0.0-2.9	0.0-0.5	.02	.02			
245:												
Wibaux----------------	0-4	15-25	1.10-1.20	0.6-2	0.11-0.14	0.0-2.9	1.0-3.0	.17	.32	2	8	0
	4-12	15-25	1.10-1.25	2-6	0.05-0.10	0.0-2.9	0.0-0.5	.05	.32			
	12-60	0-2	---	20-20	0.01-0.02	0.0-2.9	0.0-0.0	.02	.02			
Shingle---------------	0-1	15-25	1.15-1.25	0.6-2	0.16-0.18	0.0-2.9	1.0-2.0	.32	.32	2	5	56
	1-12	20-35	1.25-1.40	0.6-2	0.16-0.20	3.0-5.9	0.0-0.5	.37	.37			
	12-60	---	---	---	---	---	---	---	---			
Badland---------------	0-60	---	---	0.001-0.06	---	---	---	---	---	1	8	0

Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Perm	Available water capacity	Shrink-swell potential	Organic matter	Erosion factors Kw	Kf	T	Wind erodi-bility group	Wind erodi-bility index
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
246:												
Wyarno----------------	0-3	28-35	1.25-1.35	0.6-2	0.18-0.20	3.0-5.9	1.0-2.0	.32	.32	5	6	48
	3-12	35-50	1.20-1.35	0.06-0.2	0.16-0.19	6.0-8.9	0.5-1.0	.37	.37			
	12-60	30-40	1.25-1.35	0.2-0.6	0.16-0.18	3.0-5.9	0.0-0.5	.43	.43			
Ulm-------------------	0-4	28-35	1.15-1.25	0.2-0.6	0.18-0.20	3.0-5.9	1.0-2.0	.37	.37	5	6	48
	4-25	35-50	1.20-1.35	0.06-0.2	0.16-0.20	6.0-8.9	0.5-1.0	.37	.37			
	25-60	25-40	1.25-1.35	0.2-0.6	0.17-0.19	3.0-5.9	0.0-0.5	.37	.37			
247:												
Wyotite---------------	0-2	15-25	1.15-1.25	0.6-2	0.16-0.18	0.0-2.9	1.0-3.0	.37	.37	5	5	56
	2-38	28-35	1.20-1.30	0.6-2	0.19-0.21	3.0-5.9	0.5-1.0	.43	.43			
	38-60	15-35	1.25-1.35	0.6-2	0.15-0.17	3.0-5.9	0.0-0.5	.43	.43			
Ulm-------------------	0-6	20-27	1.20-1.30	0.6-2	0.16-0.18	0.0-2.9	1.0-2.0	.37	.37	5	5	56
	6-23	35-50	1.20-1.30	0.06-0.2	0.16-0.20	6.0-8.9	0.5-1.0	.43	.43			
	23-60	28-40	1.20-1.30	0.2-0.6	0.18-0.20	3.0-5.9	0.0-0.5	.49	.49			
248:												
Ziggy-----------------	0-5	15-25	1.15-1.25	0.6-2	0.16-0.18	0.0-2.9	1.0-3.0	.32	.32	5	5	56
	5-14	20-35	1.25-1.35	0.6-2	0.16-0.18	0.0-2.9	0.5-1.0	.37	.37			
	14-60	20-35	1.40-1.50	0.6-2	0.19-0.21	3.0-5.9	0.0-0.5	.37	.37			
Iwait-----------------	0-6	15-25	1.15-1.25	0.6-2	0.16-0.18	0.0-2.9	1.0-3.0	.32	.32	5	4L	86
	6-60	20-35	1.40-1.50	0.6-2	0.19-0.21	3.0-5.9	0.0-0.5	.37	.37			
249:												
Ziggy-----------------	0-5	15-25	1.15-1.25	0.6-2	0.16-0.18	0.0-2.9	1.0-3.0	.32	.32	5	5	56
	5-14	20-35	1.25-1.35	0.6-2	0.16-0.18	0.0-2.9	0.5-1.0	.37	.37			
	14-60	20-35	1.40-1.50	0.6-2	0.19-0.21	3.0-5.9	0.0-0.5	.37	.37			
Iwait-----------------	0-6	15-25	1.15-1.25	0.6-2	0.16-0.18	0.0-2.9	1.0-3.0	.32	.32	5	4L	86
	6-60	20-35	1.40-1.50	0.6-2	0.19-0.21	3.0-5.9	0.0-0.5	.37	.37			
250:												
Ziggy-----------------	0-5	15-25	1.15-1.25	0.6-2	0.16-0.18	0.0-2.9	1.0-3.0	.32	.32	5	5	56
	5-14	20-35	1.25-1.35	0.6-2	0.16-0.18	0.0-2.9	0.5-1.0	.37	.37			
	14-60	20-35	1.40-1.50	0.6-2	0.19-0.21	3.0-5.9	0.0-0.5	.37	.37			
Ucross----------------	0-5	15-25	1.15-1.25	0.6-2	0.16-0.18	0.0-2.9	1.0-3.0	.32	.32	3	4L	86
	5-31	20-35	1.40-1.50	0.6-2	0.19-0.21	3.0-5.9	0.0-0.5	.37	.37			
	31-60	---	---	0.001-0.06	---	---	---	---	---			
Oldwolf---------------	0-3	15-25	1.15-1.25	0.6-2	0.16-0.18	0.0-2.9	1.0-3.0	.32	.32	3	5	56
	3-21	20-35	1.25-1.35	0.6-2	0.19-0.21	3.0-5.9	0.5-1.0	.37	.37			
	21-32	20-35	1.40-1.50	0.6-2	0.16-0.18	0.0-2.9	0.0-0.5	.37	.37			
	32-60	---	---	0.001-0.06	---	---	---	---	---			

Chemical Properties of the Soils

(Dashes (--) indicate that data were not available or were not estimated.)

Map symbol and soil name	Depth	Clay	Cation exchange capacity	Soil reaction	Calcium carbon-ate	Gypsum	Salinity	Sodium adsorp-tion ratio
	In	Pct	meq/100 g	pH	Pct	Pct	mmhos/cm	
100:								
Aridic Ustorthents, saline	0-2	20-27	14-18	6.6-7.8	0-1	0	0.0-2.0	0-5
	2-6	30-40	16-21	7.4-8.4	2-5	0	2.0-4.0	1-10
	6-46	25-40	13-18	7.4-8.4	2-10	1-2	8.0-16.0	1-13
	46-60	20-35	10-17	7.4-8.4	2-10	0-2	8.0-16.0	1-13
101:								
Arvada, thick surface	0-7	8-18	7-13	6.6-7.8	0	0	0	0
	7-15	35-40	20-22	7.4-8.4	0	0	0.0-2.0	3-10
	15-26	35-50	19-26	8.5-9.0	0-5	0-1	4.0-12.0	13-30
	26-60	35-50	19-26	8.5-9.0	6-12	1-2	8.0-16.0	13-30
102:								
Arvada, thick surface	0-7	8-18	7-13	6.6-7.8	0	0	0	0
	7-15	35-40	20-22	7.4-8.4	0	0	0.0-2.0	3-10
	15-26	35-50	19-26	8.5-9.0	0-5	0-1	4.0-12.0	13-30
	26-60	35-50	19-26	8.5-9.0	6-12	1-2	8.0-16.0	13-30
Arvada	0-2	12-20	9-13	7.4-8.4	0	0	0.0-2.0	0
	2-9	35-45	18-23	8.5-9.6	0	0	2.0-4.0	13-30
	9-15	35-45	18-23	7.9-9.6	3-10	0-1	4.0-12.0	13-30
	15-60	30-45	16-23	7.9-9.6	6-12	1-2	8.0-16.0	10-25
Slickspots	---	---	---	---	---	---	---	---
103:								
Arwite	0-5	10-18	7-16	6.6-7.8	0	0	0	0
	5-32	20-35	11-19	6.6-8.4	0	0	0	0
	32-60	8-18	4-10	7.4-8.4	1-5	0	0.0-2.0	0
104:								
Arwite	0-5	10-18	7-16	6.6-7.8	0	0	0	0
	5-32	20-35	11-19	6.6-8.4	0	0	0	0
	32-60	8-18	4-10	7.4-8.4	1-5	0	0.0-2.0	0
105:								
Arwite	0-5	10-18	7-16	6.6-7.8	0	0	0	0
	5-32	20-35	11-19	6.6-8.4	0	0	0	0
	32-60	8-18	4-10	7.4-8.4	1-5	0	0.0-2.0	0
Elwop	0-4	10-18	7-16	6.6-7.3	0	0	0	0
	4-24	20-35	11-19	6.6-7.8	0	0	0	0
	24-35	8-18	4-10	7.9-8.4	1-5	0	0.0-2.0	0
	35-60	---	---	---	---	---	---	---
106:								
Arwite	0-5	10-18	7-16	6.6-7.8	0	0	0	0
	5-32	20-35	11-19	6.6-8.4	0	0	0	0
	32-60	8-18	4-10	7.4-8.4	1-5	0	0.0-2.0	0
Elwop	0-4	10-18	7-16	6.6-7.3	0	0	0	0
	4-24	20-35	11-19	6.6-7.8	0	0	0	0
	24-35	8-18	4-10	7.9-8.4	1-5	0	0.0-2.0	0
	35-60	---	---	---	---	---	---	---

Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Cation exchange capacity	Soil reaction	Calcium carbon- ate	Gypsum	Salinity	Sodium adsorp- tion ratio
	In	Pct	meq/100 g	pH	Pct	Pct	mmhos/cm	
107:								
Arwite----------------	0-5	10-18	7-16	6.6-7.8	0	0	0	0
	5-32	20-35	11-19	6.6-8.4	0	0	0	0
	32-60	8-18	4-10	7.4-8.4	1-5	0	0.0-2.0	0
Vonalf----------------	0-6	10-15	5-13	6.6-7.8	0	0	0	0
	6-34	10-18	6-11	6.6-7.8	0	0	0	0
	34-60	8-18	4-10	7.4-8.4	1-5	0	0.0-2.0	0
108:								
Arwite----------------	0-5	10-18	7-16	6.6-7.8	0	0	0	0
	5-32	20-35	11-19	6.6-8.4	0	0	0	0
	32-60	8-18	4-10	7.4-8.4	1-5	0	0.0-2.0	0
Vonalf----------------	0-6	10-18	5-13	6.6-7.8	0	0	0	0
	6-34	10-18	6-11	6.6-7.8	0	0	0	0
	34-60	8-18	4-10	7.4-8.4	1-5	0	0.0-2.0	0
109:								
Bidman----------------	0-2	15-27	12-18	6.1-7.3	0	0	0	0
	2-28	35-50	21-27	6.6-7.8	0	0	0	0
	28-60	25-40	14-18	7.9-8.4	5-15	0	0.0-2.0	0
110:								
Bidman, loamy substratum----------	0-4	15-25	14-18	6.6-7.3	0	0	0	0
	4-25	35-50	20-27	6.6-7.8	0	0	0	0
	25-52	30-40	15-20	7.9-8.4	5-15	0	0.0-2.0	0
	52-60	15-30	5-10	7.9-8.4	5-15	0	0.0-2.0	0
111:								
Bidman----------------	0-2	15-25	12-18	6.1-7.3	0	0	0	0
	2-28	35-50	21-27	6.6-7.8	0	0	0	0
	28-60	25-40	14-18	7.9-8.4	5-15	0	0.0-2.0	0
Parmleed--------------	0-3	15-25	12-15	6.6-7.3	0	0	0	0
	3-21	35-50	20-26	6.6-8.4	0	0	0	0
	21-27	25-40	10-20	7.9-8.4	5-15	0-1	0.0-2.0	0-5
	27-60	---	---	---	---	---	---	---
112:								
Bidman----------------	0-2	15-25	12-18	6.1-7.3	0	0	0	0
	2-28	35-50	21-27	6.6-7.8	0	0	0	0
	28-48	25-40	14-18	7.9-8.4	5-15	0	0.0-2.0	0
Parmleed--------------	0-3	15-25	12-15	6.6-7.3	0	0	0	0
	3-21	35-50	20-26	6.6-8.4	0	0	0	0
	21-27	25-40	10-20	7.9-8.4	5-15	0-1	0.0-2.0	0-5
	27-60	---	---	---	---	---	---	---
113:								
Bidman----------------	0-7	15-25	12-18	6.1-7.3	0	0	0	0
	7-36	35-50	21-27	6.6-7.8	0	0	0	0
	36-60	25-40	14-18	7.9-8.4	5-15	0	0.0-2.0	0
Ulm-------------------	0-4	15-25	13-18	6.6-7.3	0	0	0	0
	4-30	30-45	20-27	6.6-8.4	0	0	0	0
	30-60	25-40	14-18	7.9-8.4	5-15	0-1	0.0-2.0	0-5

Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Cation exchange capacity	Soil reaction	Calcium carbon-ate	Gypsum	Salinity	Sodium adsorp-tion ratio
	In	Pct	meq/100 g	pH	Pct	Pct	mmhos/cm	
114:								
Bowbac---------------	0-3	10-18	8-12	6.6-7.3	0	0	0	0
	3-31	20-35	12-20	6.6-7.8	0	0	0	0
	31-39	8-18	4-12	7.9-8.4	1-5	0	0.0-2.0	0
	39-60	---	---	---	---	---	---	---
Taluce---------------	0-2	10-18	6-9	6.1-7.3	0	0	0	0
	2-14	8-18	3-8	6.1-7.3	0	0	0	0
	14-60	---	---	---	---	---	---	---
Badland--------------	0-60	---	---	---	---	---	---	---
115:								
Bowbac---------------	0-3	10-18	8-12	6.6-7.3	0	0	0	0
	3-31	20-35	12-20	6.6-7.8	0	0	0	0
	31-39	8-18	4-12	7.9-8.4	1-5	0	0.0-2.0	0
	39-60	---	---	---	---	---	---	---
Worf-----------------	0-1	10-18	10-14	6.6-7.8	0	0	0	0
	1-12	20-35	14-19	6.6-7.8	0	0	0	0
	12-18	18-30	10-15	7.9-8.4	5-10	0	0.0-2.0	0
	18-60	---	---	---	---	---	---	---
116:								
Cambria--------------	0-2	15-25	14-18	6.6-7.3	0	0	0	0
	2-10	25-35	15-20	6.6-7.8	0	0	0	0
	10-60	20-30	11-16	7.9-8.4	5-15	0	0.0-2.0	0-5
Kishona--------------	0-2	15-25	9-16	7.4-8.4	0-1	0	0	0
	2-60	20-35	10-17	7.9-8.4	5-15	0	0.0-2.0	0-5
Zigweid--------------	0-2	15-25	12-18	7.4-7.8	0-1	0	0	0
	2-13	20-35	12-20	7.9-8.4	0-10	0	0	0
	13-60	20-35	12-20	7.9-8.4	5-15	0	0.0-2.0	0-5
117:								
Cambria--------------	0-3	15-25	14-18	6.6-7.3	0	0	0	0
	3-12	25-35	15-20	6.6-8.4	0	0	0	0
	12-60	20-30	11-16	7.9-8.4	5-15	0	0.0-2.0	0-5
Kishona--------------	0-2	15-25	9-16	7.4-8.4	0-1	0	0	0
	2-60	20-35	10-17	7.9-8.4	5-15	0	0.0-2.0	0-5
Zigweid--------------	0-2	15-25	12-18	7.4-7.8	0-1	0	0	0
	2-13	20-35	12-20	7.9-8.4	0-10	0	0	0
	13-60	20-35	12-20	7.9-8.4	5-15	0	0.0-2.0	0-5
118:								
Clarkelen------------	0-3	7-16	7-12	7.4-8.4	0-3	0	0	0
	3-60	8-18	6-11	7.9-8.4	1-5	0	0.0-2.0	0
Draknab--------------	0-4	7-15	7-11	6.6-7.8	0	0	0	0
	4-28	3-10	3-6	7.4-8.4	0-1	0	0	0
	28-60	1-8	1-4	7.4-8.4	0-1	0	0.0-2.0	0
119:								
Clarkelen------------	0-3	7-16	7-12	6.1-7.8	0	0	0	0
	3-60	8-18	6-11	6.1-7.8	0	0	0.0-2.0	0
Embry----------------	0-3	6-15	6-10	6.6-7.3	0	0	0	0
	3-60	8-16	5-9	6.6-7.8	0	0	0	0

Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Cation exchange capacity	Soil reaction	Calcium carbon-ate	Gypsum	Salinity	Sodium adsorp-tion ratio
	In	Pct	meq/100 g	pH	Pct	Pct	mmhos/cm	
120:								
Clarkelen------------	0-3	7-16	7-12	7.4-8.4	0-3	0	0	0
	3-60	8-18	6-11	7.9-8.4	1-5	0	0.0-2.0	0
Keeline--------------	0-4	6-16	6-11	7.4-8.4	0-5	0	0	0
	4-60	7-16	5-9	7.9-8.4	1-5	0	0.0-2.0	0
121:								
Cushman--------------	0-2	15-25	12-17	6.6-7.8	0	0	0	0
	2-19	20-35	12-20	6.6-8.4	0	0	0	0
	19-31	20-35	11-19	7.9-8.4	5-15	0	0.0-2.0	0-5
	31-60	---	---	---	---	---	---	---
Cambria--------------	0-2	15-25	14-18	6.6-7.3	0	0	0	0
	2-12	25-35	15-20	6.6-8.4	0	0	0	0
	12-60	20-30	11-16	7.9-8.4	5-15	0	0.0-2.0	0-5
122:								
Cushman--------------	0-2	15-25	7-13	6.6-7.8	0	0	0	0
	2-23	20-35	13-19	7.4-8.4	0	0	0	0
	23-30	20-35	10-16	7.9-8.4	5-15	0	0.0-2.0	0-5
	30-60	---	---	---	---	---	---	---
Cambria--------------	0-2	15-25	7-13	6.6-7.3	0	0	0	0
	2-12	20-35	13-19	6.6-7.8	0	0	0	0
	12-60	20-30	10-16	7.9-8.4	5-15	0	0.0-2.0	0-5
123:								
Cushman--------------	0-3	15-25	12-17	6.6-7.8	0	0	0	0
	3-13	20-35	12-20	7.4-8.4	0	0	0	0
	13-25	20-35	11-19	7.9-8.4	5-15	0	0.0-2.0	0-5
	25-60	---	---	---	---	---	---	---
Renohill-------------	0-2	20-27	13-16	6.6-7.3	0	0	0	0
	2-14	35-50	17-25	7.4-8.4	0	0	0	0
	14-26	30-40	15-20	7.9-8.4	5-15	0-1	0.0-2.0	0-5
	26-60	---	---	---	---	---	---	---
124:								
Cushman--------------	0-3	15-25	12-17	6.6-7.8	0	0	0	0
	3-13	20-35	12-20	7.4-8.4	0	0	0	0
	13-25	20-35	11-19	7.9-8.4	5-15	0	0.0-2.0	0-5
	25-60	---	---	---	---	---	---	---
Shingle--------------	0-1	15-25	11-19	7.4-8.4	0-3	0	0	0
	1-12	20-35	10-17	7.9-8.4	5-10	0	0.0-2.0	0-5
	12-60	---	---	---	---	---	---	---
125:								
Cushman--------------	0-3	15-25	12-17	6.6-7.8	0	0	0	0
	3-13	20-35	12-20	7.4-8.4	0	0	0	0
	13-25	20-35	11-19	7.9-8.4	5-15	0	0.0-2.0	0-5
	25-60	---	---	---	---	---	---	---
Terro----------------	0-3	10-18	6-9	6.6-7.8	0	0	0	0
	3-16	10-18	6-10	6.6-7.8	0	0	0	0
	16-23	8-18	6-10	7.4-8.4	1-5	0	0.0-2.0	0
	23-60	---	---	---	---	---	---	---

Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Cation exchange capacity	Soil reaction	Calcium carbon-ate	Gypsum	Salinity	Sodium adsorp-tion ratio
	In	Pct	meq/100 g	pH	Pct	Pct	mmhos/cm	
126:								
Cushman---------------	0-2	15-25	12-17	6.6-7.8	0	0	0	0
	2-23	20-35	12-20	6.6-8.4	0	0	0	0
	23-30	20-35	11-19	7.9-8.4	5-15	0	0.0-2.0	0-5
	30-60	---	---	---	---	---	---	---
Theedle---------------	0-2	15-25	11-18	6.6-8.4	0-5	0	0	0
	2-28	20-35	10-16	7.4-8.4	5-15	0	0.0-2.0	0-5
	28-60	---	---	---	---	---	---	---
127:								
Cushman---------------	0-3	15-25	12-17	6.6-7.8	0	0	0	0
	3-13	20-35	12-20	6.6-8.4	0	0	0	0
	13-25	20-35	11-19	7.9-8.4	5-15	0	0.0-2.0	0-5
	25-60	---	---	---	---	---	---	---
Theedle---------------	0-2	15-25	11-18	6.6-8.4	0-5	0	0	0
	2-28	20-35	10-16	7.4-8.4	5-15	0	0.0-2.0	0-5
	28-60	---	---	---	---	---	---	---
128:								
Cushman---------------	0-5	15-25	12-17	6.6-7.8	0	0	0	0
	5-25	20-35	12-20	6.6-8.4	0	0	0	0
	25-35	20-35	11-19	7.9-8.4	5-15	0	0.0-2.0	0-5
	35-60	---	---	---	---	---	---	---
Worf------------------	0-2	15-25	11-16	6.6-7.8	0	0	0	0
	2-10	20-35	14-19	6.6-7.8	0	0	0	0
	10-18	18-30	10-15	7.9-8.4	5-10	0	0.0-2.0	0-5
	18-60	---	---	---	---	---	---	---
129:								
Decolney--------------	0-3	10-18	10-14	6.6-7.3	0	0	0	0
	3-22	20-35	12-16	6.6-7.8	0	0	0	0
	22-43	10-18	8-14	7.4-7.9	0	0	0	0
	43-60	10-18	6-12	7.9-8.4	1-5	0	0.0-2.0	0
Hiland----------------	0-4	10-18	9-13	6.6-7.3	0	0	0	0
	4-15	20-35	12-19	6.6-8.4	0	0	0	0
	15-60	10-18	5-9	7.9-8.4	1-5	0	0.0-2.0	0
130:								
Decolney--------------	0-3	10-18	10-14	6.6-7.3	0	0	0	0
	3-22	20-35	12-16	6.6-7.8	0	0	0	0
	22-43	10-18	8-14	7.4-7.9	0	0	0	0
	43-60	10-18	6-12	7.9-8.4	1-5	0	0.0-2.0	0
Hiland----------------	0-3	10-18	9-13	6.6-7.3	0	0	0	0
	3-32	20-35	12-19	6.6-8.4	0	0	0	0
	32-60	10-18	5-9	7.9-8.4	1-5	0	0.0-2.0	0
131:								
Deekay----------------	0-4	15-25	9-19	6.6-7.3	0	0	0	0
	4-24	20-35	13-20	6.6-8.4	0	0	0	0
	24-60	20-35	7-16	7.9-8.4	5-15	0	0.0-2.0	0-5
132:								
Deekay----------------	0-4	15-25	9-19	6.6-7.3	0	0	0	0
	4-24	20-35	13-20	6.6-8.4	0	0	0	0
	24-60	20-35	7-16	7.9-8.4	5-15	0	0.0-2.0	0-5

Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Cation exchange capacity	Soil reaction	Calcium carbon- ate	Gypsum	Salinity	Sodium adsorp- tion ratio
	In	Pct	meq/100 g	pH	Pct	Pct	mmhos/cm	
132:(cont.)								
Moorhead	0-5	20-27	15-18	6.6-7.3	0	0	0	0
	5-35	35-50	20-27	6.6-8.4	0	0	0	0
	35-60	30-42	16-22	7.9-8.4	5-15	0-1	0.0-2.0	0-5
133:								
Deekay	0-4	15-25	9-19	6.6-7.3	0	0	0	0
	4-24	20-35	13-20	6.6-8.4	0	0	0	0
	24-60	20-35	7-16	7.9-8.4	5-15	0	0.0-2.0	0-5
Moorhead	0-5	20-27	15-18	6.6-7.3	0	0	0	0
	5-35	35-50	20-27	6.6-8.4	0	0	0	0
	35-60	30-42	16-22	7.9-8.4	5-15	0-1	0.0-2.0	0-5
134:								
Deekay	0-4	15-25	9-19	6.6-7.3	0	0	0	0
	4-24	20-35	13-20	6.6-8.4	0	0	0	0
	24-60	20-35	7-16	7.9-8.4	5-15	0	0.0-2.0	0-5
Oldwolf	0-3	15-25	9-19	6.6-7.3	0	0	0	0
	3-21	20-35	13-20	6.6-8.4	0	0	0	0
	21-32	20-35	7-16	7.9-8.4	5-15	0	0.0-2.0	0-5
	32-60	---	---	---	---	---	---	---
135:								
Deekay	0-4	15-25	9-19	6.6-7.3	0	0	0	0
	4-24	20-35	13-20	6.6-8.4	0	0	0	0
	24-60	20-35	7-16	7.9-8.4	5-15	0	0.0-2.0	0-5
Oldwolf	0-3	15-25	9-19	6.6-7.3	0	0	0	0
	3-21	20-35	13-20	6.6-8.4	0	0	0	0
	21-32	20-35	7-16	7.9-8.4	5-15	0	0.0-2.0	0-5
	32-60	---	---	---	---	---	---	---
136:								
Deekay	0-4	15-25	9-19	6.6-7.3	0	0	0	0
	4-24	20-35	13-20	6.6-8.4	0	0	0	0
	24-60	20-35	7-16	7.9-8.4	5-15	0	0.0-2.0	0-5
Ziggy	0-5	15-25	9-19	6.6-7.8	0-1	0	0	0
	5-14	20-35	11-20	7.4-8.4	0-10	0	0	0
	14-60	20-35	10-18	7.9-8.4	5-15	0	0.0-2.0	0-5
137:								
Echeta	0-3	30-40	17-26	6.6-7.8	0	0	0	0
	3-15	35-50	18-27	7.4-8.4	0-10	0	0	0
	15-60	30-50	15-26	7.9-8.4	5-15	0-1	0.0-2.0	0-5
138:								
Echeta	0-3	30-40	17-26	6.6-7.8	0	0	0	0
	3-15	35-50	18-27	7.4-8.4	0-10	0	0	0
	15-60	30-50	15-26	7.9-8.4	5-15	0-1	0.0-2.0	0-5
Cromack	0-6	30-40	17-26	6.6-8.4	0-3	0	0	0
	6-14	35-50	18-27	7.4-8.4	0-10	0	0	0
	14-29	30-50	15-26	7.9-8.4	5-15	0-1	0.0-2.0	0-5
	29-60	---	---	---	---	---	---	---

Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Cation exchange capacity	Soil reaction	Calcium carbon-ate	Gypsum	Salinity	Sodium adsorp-tion ratio
	In	Pct	meq/100 g	pH	Pct	Pct	mmhos/cm	
139:								
Embry----------------	0-4	6-15	6-10	6.6-7.3	0	0	0	0
	4-60	8-16	5-9	6.6-7.8	0	0	0	0
Orpha----------------	0-4	3-8	4-8	6.6-7.8	0	0	0	0
	4-60	3-8	2-5	6.6-7.8	0	0	0	0
140:								
Embry----------------	0-6	6-15	6-10	6.6-7.3	0	0	0	0
	6-60	8-16	5-9	6.6-7.8	0	0	0	0
Taluce---------------	0-4	10-18	6-9	6.1-7.3	0	0	0	0
	4-16	8-18	3-8	6.1-7.3	0	0	0	0
	16-60	---	---	---	---	---	---	---
141:								
Emigha---------------	0-1	15-27	14-18	7.4-7.8	0-5	0	0	0
	1-19	28-35	16-20	7.9-9.0	2-8	0	2.0-4.0	1-13
	19-60	20-35	10-18	7.9-9.0	5-10	0-2	4.0-8.0	1-13
142:								
Emigha, sodic--------	0-3	28-35	16-20	7.4-7.8	0-3	0	2.0-4.0	2-10
	3-14	28-35	15-19	8.4-9.6	2-8	0	8.0-16.0	13-30
	14-60	25-35	13-18	7.9-9.0	2-8	0-2	8.0-16.0	13-25
Arvada, thick surface	0-3	18-27	12-16	6.6-7.8	0	0	0	0
	3-12	35-40	20-22	7.4-8.4	0	0	0.0-2.0	3-10
	12-30	35-50	19-26	8.5-9.0	0-5	1-2	4.0-12.0	13-30
	30-46	35-50	19-26	8.5-9.0	6-12	1-2	8.0-16.0	13-30
	46-60	35-45	18-23	7.9-9.0	6-12	1-2	8.0-16.0	10-25
143:								
Felix, ponded--------	0-5	55-75	40-58	6.1-7.3	0	0	0	0
	5-30	60-80	43-58	6.6-7.8	0-2	0	0	0-5
	30-50	60-75	42-53	7.4-8.4	0-2	0	2.0-4.0	0-5
	50-60	50-70	35-50	7.4-8.4	0-5	0-2	2.0-4.0	0-5
144:								
Forkwood-------------	0-2	15-25	9-16	6.6-7.8	0	0	0	0
	2-23	20-35	11-19	6.6-8.4	0	0	0	0
	23-60	20-35	8-16	7.9-8.4	5-15	0	0.0-2.0	0-5
145:								
Forkwood-------------	0-3	15-25	12-17	6.6-7.3	0	0	0	0
	3-14	20-35	14-20	6.6-8.4	0	0	0	0
	14-60	20-30	10-15	7.9-8.4	5-15	0	0.0-2.0	0-5
Cambria--------------	0-2	15-25	14-18	6.6-7.3	0	0	0	0
	2-12	25-35	15-20	6.6-8.4	0	0	0	0
	12-60	20-30	11-16	7.9-8.4	5-15	0	0.0-2.0	0-5
146:								
Forkwood-------------	0-2	15-25	9-16	6.6-7.8	0	0	0	0
	2-23	20-35	11-19	6.6-8.4	0	0	0	0
	23-60	20-35	8-16	7.9-8.4	5-15	0	0.0-2.0	0-5
Cushman--------------	0-2	15-25	7-13	6.6-7.8	0	0	0	0
	2-23	20-35	13-19	7.4-8.4	0	0	0	0
	23-30	20-35	10-16	7.9-8.4	5-15	0	0.0-2.0	0-5
	30-60	---	---	---	---	---	---	---

Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Cation exchange capacity	Soil reaction	Calcium carbon-ate	Gypsum	Salinity	Sodium adsorp-tion ratio
	In	Pct	meq/100 g	pH	Pct	Pct	mmhos/cm	
147:								
Forkwood-------------	0-2	15-25	9-16	6.6-7.8	0	0	0	0
	2-23	20-35	11-19	6.6-8.4	0	0	0	0
	23-60	20-35	8-16	7.9-8.4	5-15	0	0.0-2.0	0-5
Cushman--------------	0-2	15-25	7-13	6.6-7.8	0	0	0	0
	2-23	20-35	13-19	7.4-8.4	0	0	0	0
	23-30	20-35	10-16	7.9-8.4	5-15	0	0.0-2.0	0-5
	30-60	---	---	---	---	---	---	---
148:								
Forkwood-------------	0-2	15-25	9-16	6.6-7.8	0	0	0	0
	2-23	20-35	11-19	6.6-8.4	0	0	0	0
	23-60	20-35	8-16	7.9-8.4	5-15	0	0.0-2.0	0-5
Ulm------------------	0-2	15-25	9-16	6.6-7.3	0	0	0	0
	2-22	35-50	19-27	6.6-8.4	0	0	0	0
	22-60	25-40	15-23	7.9-8.4	5-15	0-1	0.0-2.0	0-5
149:								
Forkwood-------------	0-2	15-25	9-16	6.6-7.8	0	0	0	0
	2-23	20-35	11-19	6.6-8.4	0	0	0	0
	23-60	20-35	8-16	7.9-8.4	5-15	0	0.0-2.0	0-5
Ulm------------------	0-2	15-25	9-16	6.6-7.3	0	0	0	0
	2-22	35-50	19-27	6.6-8.4	0	0	0	0
	22-60	25-40	15-23	7.9-8.4	5-15	0-1	0.0-2.0	0-5
150:								
Gateson--------------	0-2	---	---	---	---	---	---	---
	2-6	2-8	3-5	6.1-7.3	0	0	0	0
	6-11	5-25	3-5	6.1-7.3	0	0	0	0
	11-30	20-30	14-17	6.6-7.8	0	0	0	0
	30-60	---	---	---	---	---	---	---
Taluce---------------	0-3	10-18	6-9	6.1-7.3	0	0	0	0
	3-16	8-18	3-8	6.1-7.3	0	0	0	0
	16-60	---	---	---	---	---	---	---
Turnercrest----------	0-4	4-8	2-4	6.1-7.3	0	0	0	0
	4-32	10-18	4-9	6.1-7.3	0	0	0	0
	32-60	---	---	---	---	---	---	---
151:								
Haverdad, loam-------	0-4	15-25	12-16	6.6-8.4	0-5	0	0.0-1.0	0
	4-60	15-35	12-16	7.4-9.0	1-10	0	0.0-5.0	0-5
152:								
Haverdad-------------	0-3	15-25	12-16	7.4-8.4	0-5	0	0.0-2.0	0
	3-60	20-35	12-18	7.4-8.4	3-8	0	2.0-4.0	0-5
Clarkelen------------	0-4	7-16	7-12	7.4-8.4	0-3	0	0	0
	4-60	8-18	6-11	7.9-8.4	1-5	0	0.0-2.0	0
153:								
Haverdad-------------	0-7	28-35	16-20	7.4-8.4	0-5	0	0.0-2.0	0
	7-60	20-35	12-19	7.4-8.4	3-8	0	2.0-4.0	0-5
Kishona--------------	0-3	28-35	16-21	7.4-8.4	0-1	0	0	0
	3-60	20-35	10-17	7.9-8.4	5-15	0	2.0-4.0	0-5

Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Cation exchange capacity	Soil reaction	Calcium carbon-ate	Gypsum	Salinity	Sodium adsorp-tion ratio
	In	Pct	meq/100 g	pH	Pct	Pct	mmhos/cm	
154:								
Heldt----------------	0-3	30-40	20-23	7.4-8.4	0-5	0	0	0
	3-25	40-50	21-26	7.9-9.0	1-5	0	2.0-4.0	1-5
	25-60	35-45	18-23	7.9-9.0	5-10	0-2	2.0-4.0	1-5
155:								
Heldt, saline--------	0-2	30-40	17-24	7.4-8.4	0-5	0	0.0-2.0	0-5
	2-22	35-50	19-27	7.9-9.0	5-10	0-1	8.0-16.0	2-13
	22-60	35-45	19-27	7.9-9.0	5-10	0-1	8.0-16.0	2-13
Bidman, saline-------	0-4	15-25	9-17	6.6-7.8	0	0	0.0-2.0	0
	4-13	35-50	19-27	7.4-8.4	0	0-1	4.0-8.0	2-10
	13-60	30-45	15-24	7.9-9.0	5-10	0-1	8.0-16.0	2-13
156:								
Hiland---------------	0-3	10-18	9-13	6.6-7.3	0	0	0	0
	3-19	20-35	12-19	6.6-8.4	0	0	0	0
	19-60	10-18	5-9	7.9-8.4	1-5	0	0.0-2.0	0
157:								
Hiland---------------	0-4	10-18	9-13	6.6-7.3	0	0	0	0
	4-24	20-35	12-19	6.6-8.4	0	0	0	0
	24-60	10-18	5-9	7.9-8.4	1-5	0	0.0-2.0	0
Bowbac---------------	0-3	10-18	8-12	6.6-7.3	0	0	0	0
	3-31	20-35	12-20	6.6-7.8	0	0	0	0
	31-39	8-18	4-12	7.9-8.4	1-5	0	0.0-2.0	0
	39-60	---	---	---	---	---	---	---
158:								
Hiland---------------	0-4	10-18	9-13	6.6-7.3	0	0	0	0
	4-24	20-35	12-19	6.6-8.4	0	0	0	0
	24-60	10-18	5-9	7.9-8.4	1-5	0	0.0-2.0	0
Bowbac---------------	0-3	10-18	8-12	6.6-7.3	0	0	0	0
	3-31	20-35	12-20	6.6-7.8	0	0	0	0
	31-39	8-18	4-12	7.9-8.4	1-5	0	0.0-2.0	0
	39-60	---	---	---	---	---	---	---
159:								
Hiland---------------	0-3	10-18	9-13	6.6-7.3	0	0	0	0
	3-23	20-35	12-19	6.6-8.4	0	0	0	0
	23-60	10-18	5-9	7.9-8.4	1-5	0	0.0-2.0	0
Vonalee--------------	0-5	10-18	7-10	6.6-7.8	0	0	0	0
	5-16	10-18	7-11	6.6-7.8	0	0	0	0
	16-60	8-18	2-6	7.4-8.4	1-5	0	0.0-2.0	0
160:								
Hiland---------------	0-3	10-18	9-13	6.6-7.3	0	0	0	0
	3-23	20-35	12-19	6.6-8.4	0	0	0	0
	23-60	10-18	5-9	7.9-8.4	1-5	0	0.0-2.0	0
Vonalee--------------	0-5	10-18	7-10	6.6-7.8	0	0	0	0
	5-24	10-18	7-11	6.6-7.8	0	0	0	0
	24-60	8-18	2-6	7.4-8.4	1-5	0	0.0-2.0	0
161:								
Hilight--------------	0-2	30-40	20-23	6.6-7.8	0	0	0	0
	2-14	40-55	20-27	6.1-7.8	0	0-1	0	0
	14-60	---	---	---	---	---	---	---

Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Cation exchange capacity	Soil reaction	Calcium carbon- ate	Gypsum	Salinity	Sodium adsorp- tion ratio
	In	Pct	meq/100 g	pH	Pct	Pct	mmhos/cm	
161: (cont.)								
Taluce, cool----------	0-4	10-18	6-9	6.1-7.3	0	0	0	0
	4-18	8-18	3-8	6.1-7.3	0	0	0	0
	18-60	---	---	---	---	---	---	---
Wags------------------	0-4	30-40	22-27	6.6-7.8	0	0	0	0
	4-34	40-60	21-31	6.1-7.8	0	0-2	0	0
	34-60	---	---	---	---	---	---	---
162:								
Lismas----------------	0-3	30-40	19-32	6.1-7.8	0	0	0	0
	3-16	40-60	29-41	6.1-7.8	0	0-2	0.0-2.0	0-5
	16-60	---	---	---	---	---	---	---
Mittenbutte, cool-----	0-4	10-18	7-13	6.1-7.3	0	0	0	0
	4-18	8-18	5-10	6.6-7.8	0	0	0	0
	18-60	---	---	---	---	---	---	---
Sabatka---------------	0-3	30-40	22-32	6.6-7.8	0	0	0	0
	3-19	35-55	29-44	6.6-7.8	0	0	0	0
	19-30	30-50	29-44	6.1-7.8	0	0-2	0	0-5
	30-60	---	---	---	---	---	---	---
163:								
Hilight---------------	0-2	40-55	22-29	6.1-7.8	0	0	0	0
	2-12	40-55	20-27	6.1-7.8	0	0-1	0	0
	12-60	---	---	---	---	---	---	---
Wags------------------	0-1	30-40	17-22	6.6-7.8	0	0	0	0
	1-23	40-60	21-31	6.1-7.8	0	0-2	0	0
	23-60	---	---	---	---	---	---	---
Badland---------------	0-60	---	---	---	---	---	---	---
164:								
Lismas----------------	0-3	30-40	19-32	6.1-7.8	0	0	0	0
	3-16	40-60	29-41	6.1-7.8	0	0-2	0.0-2.0	0-5
	16-60	---	---	---	---	---	---	---
Sabatka---------------	0-3	30-40	22-32	6.6-7.8	0	0	0	0
	3-19	35-55	29-44	6.6-7.8	0	0	0	0
	19-30	30-50	29-44	6.1-7.8	0	0-2	0	0-5
	30-60	---	---	---	---	---	---	---
Badland---------------	0-60	---	---	---	---	---	---	---
165:								
Jayem-----------------	0-17	10-18	8-15	6.6-7.3	0	0	0	0
	17-31	10-18	4-9	6.6-7.3	0	0	0	0
	31-60	8-18	3-9	6.6-7.8	0	0	0	0
166:								
Jaywest---------------	0-7	15-25	9-19	6.1-7.3	0	0	0	0
	7-36	35-50	18-27	6.6-8.4	0	0	0	0
	36-60	25-40	15-23	7.9-8.4	5-15	0-1	0.0-2.0	0-5
167:								
Jaywest---------------	0-7	15-25	9-19	6.1-7.3	0	0	0	0
	7-36	35-50	18-27	6.6-8.4	0	0	0	0
	36-60	25-40	15-23	7.9-8.4	5-15	0-1	0.0-2.0	0-5

Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Cation exchange capacity	Soil reaction	Calcium carbon- ate	Gypsum	Salinity	Sodium adsorp- tion ratio
	In	Pct	meq/100 g	pH	Pct	Pct	mmhos/cm	
167:(cont.)								
Moorhead	0-5	20-27	15-18	6.6-7.3	0	0	0	0
	5-35	35-50	20-27	6.6-8.4	0	0	0	0
	35-60	30-42	16-22	7.9-8.4	5-15	0-1	0.0-2.0	0-5
168:								
Jaywest	0-7	15-25	9-19	6.1-7.3	0	0	0	0
	7-36	35-50	18-27	6.6-8.4	0	0	0	0
	36-60	25-40	15-23	7.9-8.4	5-15	0-1	0.0-2.0	0-5
Spottedhorse	0-4	15-25	9-19	6.1-7.8	0	0	0	0
	4-27	35-50	18-27	6.6-8.4	0	0	0	0
	27-35	30-45	15-23	7.9-8.4	5-15	0	0.0-2.0	0-5
	35-60	---	---	---	---	---	---	---
169:								
Julesburg	0-10	10-18	9-13	6.6-7.3	0	0	0	0
	10-32	10-18	7-12	6.6-7.8	0	0	0	0
	32-60	8-15	3-7	6.6-7.8	0	0	0	0
170:								
Keeline	0-6	2-8	4-7	7.4-8.4	0-5	0	0	0
	6-60	7-16	5-9	7.9-8.4	1-5	0	0.0-2.0	0
Tullock	0-4	2-6	4-7	6.6-7.8	0-2	0	0	0
	4-28	2-8	1-4	7.4-8.4	1-5	0	0.0-2.0	0
	28-60	---	---	---	---	---	---	---
171:								
Keeline	0-4	6-16	6-11	7.4-8.4	0-5	0	0	0
	4-60	7-16	5-9	7.9-8.4	1-5	0	0.0-2.0	0
Tullock	0-4	2-6	4-7	6.6-7.8	0-2	0	0	0
	4-22	2-8	1-4	7.4-8.4	1-5	0	0.0-2.0	0
	22-60	---	---	---	---	---	---	---
Niobrara, dry	0-3	2-8	2-5	6.1-7.3	0-1	0	0	0
	3-12	2-8	1-4	6.6-7.3	0	0	0	0
	12-60	---	---	---	---	---	---	---
172:								
Keyner	0-4	10-20	8-13	7.4-7.8	0	0	0.0-2.0	0-5
	4-12	20-35	12-19	7.9-8.4	0	0	0.0-2.0	2-10
	12-20	20-35	10-17	8.5-9.6	0-2	0-1	8.0-16.0	10-20
	20-26	20-35	10-17	8.5-9.6	5-10	0-1	8.0-16.0	15-30
	26-60	15-30	6-12	8.5-9.6	5-15	0-1	8.0-16.0	15-30
173:								
Lawver	0-4	10-25	12-15	6.6-7.8	0	0	0	0
	4-20	35-50	18-26	6.6-7.8	0	0	0	0
	20-27	35-45	19-24	7.4-8.4	5-10	0	0	0
	27-38	20-35	13-18	7.9-8.4	5-10	0	0	0-5
	38-60	6-15	4-7	6.1-7.8	0-3	0	0	0
Teckla	0-10	10-20	9-13	6.6-7.3	0	0	0	0
	10-23	20-35	12-19	6.6-7.8	0	0	0	0
	23-31	20-35	12-19	6.6-7.8	0	0	0	0
	31-45	10-25	7-12	7.9-9.0	5-15	0	0	0-5
	45-60	5-15	3-6	6.6-8.4	0-5	0	0	0-5

Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Cation exchange capacity	Soil reaction	Calcium carbon- ate	Gypsum	Salinity	Sodium adsorp- tion ratio
	In	Pct	meq/100 g	pH	Pct	Pct	mmhos/cm	
173: (cont.)								
Wibaux---------------	0-3	15-25	11-16	6.6-7.8	0	0	0	0
	3-13	10-25	9-14	6.6-7.8	0	0	0	0
	13-60	0-2	0-0	---	0-1	0	0	0
174:								
Brislawn-------------	0-6	15-25	9-19	6.1-7.3	0	0	0	0
	6-21	35-50	18-27	6.6-7.8	0	0	0	0
	21-31	30-45	16-25	7.4-8.4	0-5	0	0.0-2.0	0
	31-37	20-35	10-19	7.9-8.4	5-15	0	0.0-2.0	0-5
	37-60	0-2	---	---	0-5	---	---	---
Rockybutte-----------	0-5	15-25	9-19	6.6-7.8	0	0	0	0
	5-23	20-35	11-20	6.6-7.8	0	0	0	0
	23-38	20-35	10-19	7.4-8.4	5-15	0	0.0-2.0	0-5
	38-60	0-2	---	---	---	---	---	---
Ironbutte------------	0-4	15-25	9-19	6.6-7.8	0	0	0	0
	4-12	10-25	5-14	6.6-8.4	0-3	0	0	0
	12-60	0-2	0-0	---	0-1	0	0	0
175:								
Lawver---------------	0-4	10-25	12-15	6.6-7.8	0	0	0	0
	4-20	35-50	18-26	6.6-7.8	0	0	0	0
	20-27	35-45	19-24	7.4-8.4	5-10	0	0	0
	27-38	20-35	13-18	7.9-8.4	5-10	0	0	0-5
	38-60	6-15	4-7	6.1-7.8	0-3	0	0	0
Wibaux---------------	0-3	15-25	11-16	6.6-7.8	0	0	0	0
	3-13	10-25	9-14	6.6-7.8	0	0	0	0
	13-60	0-2	0-0	---	0-1	0	0	0
176:								
Leiter---------------	0-3	28-35	16-24	6.6-7.8	0	0	0	0
	3-22	35-50	26-37	6.6-8.4	0	0	0	0
	22-33	30-45	14-32	7.9-8.4	5-15	0-1	0.0-2.0	0-5
	33-60	---	---	---	---	---	---	---
Cromack--------------	0-6	30-40	17-26	6.6-8.4	0-3	0	0	0
	6-14	35-50	18-27	7.4-8.4	0-10	0	0	0
	14-29	30-50	15-26	7.9-8.4	5-15	0-1	0.0-2.0	0-5
	29-60	---	---	---	---	---	---	---
177:								
Maysdorf-------------	0-3	10-18	10-14	6.6-7.3	0	0	0	0
	3-33	20-35	12-18	6.6-7.8	0	0	0	0
	33-60	10-18	8-12	7.9-8.4	5-10	0	0.0-2.0	0
178:								
Maysdorf-------------	0-5	20-25	14-17	6.6-7.3	0	0	0	0
	5-26	20-35	12-18	6.6-7.8	0	0	0	0
	26-60	10-18	8-12	7.9-8.4	5-10	0	0.0-2.0	0
179:								
Maysdorf-------------	0-5	10-18	10-14	6.6-7.3	0	0	0	0
	5-20	20-35	12-18	6.6-7.8	0	0	0	0
	20-60	10-18	8-12	7.9-8.4	5-10	0	0.0-2.0	0

Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Cation exchange capacity	Soil reaction	Calcium carbon-ate	Gypsum	Salinity	Sodium adsorp-tion ratio
	In	Pct	meq/100 g	pH	Pct	Pct	mmhos/cm	
179:(cont.)								
Pugsley	0-4	10-18	7-11	6.6-7.3	0	0	0	0
	4-15	20-30	12-19	6.6-7.8	0	0	0	0
	15-23	8-18	4-10	7.4-7.8	0-2	0	0.0-2.0	0
	23-60	---	---	---	---	---	---	---
180:								
Maysdorf	0-5	10-18	10-14	6.6-7.3	0	0	0	0
	5-20	20-35	12-18	6.6-7.8	0	0	0	0
	20-60	10-18	8-12	7.9-8.4	5-10	0	0.0-2.0	0
Pugsley	0-4	10-18	7-11	6.6-7.3	0	0	0	0
	4-15	20-30	12-19	6.6-7.8	0	0	0	0
	15-23	8-18	4-10	7.4-7.8	0-2	0	0.0-2.0	0
	23-60	---	---	---	---	---	---	---
181:								
Moorhead	0-4	28-35	16-24	6.6-7.3	0	0	0	0
	4-24	35-50	26-37	6.6-8.4	0	0	0	0
	24-60	30-45	14-32	7.9-8.4	5-15	0-1	0.0-2.0	0-5
182:								
Moorhead	0-3	20-27	15-18	6.6-7.3	0	0	0	0
	3-25	35-45	20-27	6.6-8.4	0	0	0	0
	25-60	30-42	16-22	7.9-8.4	5-15	0-1	0.0-2.0	0-5
183:								
Moorhead	0-4	28-35	16-24	6.6-7.3	0	0	0	0
	4-24	35-50	26-37	6.6-8.4	0	0	0	0
	24-60	30-45	14-32	7.9-8.4	5-15	0-1	0.0-2.0	0-5
Leiter	0-3	28-35	16-24	6.6-7.8	0	0	0	0
	3-22	35-50	26-37	6.6-8.4	0	0	0	0
	22-33	30-45	14-32	7.9-8.4	5-15	0-1	0.0-2.0	0-5
	33-60	---	---	---	---	---	---	---
184:								
Moorhead	0-4	28-35	16-24	6.6-7.3	0	0	0	0
	4-24	35-50	26-37	6.6-8.4	0	0	0	0
	24-60	30-45	14-32	7.9-8.4	5-15	0-1	0.0-2.0	0-5
Leiter	0-3	28-35	16-24	6.6-7.8	0	0	0	0
	3-22	35-50	26-37	6.6-8.4	0	0	0	0
	22-33	30-45	14-32	7.9-8.4	5-15	0-1	0.0-2.0	0-5
	33-60	---	---	---	---	---	---	---
185:								
Moskee	0-9	10-18	7-16	6.6-7.3	0	0	0	0
	9-32	20-35	11-19	6.6-8.4	0	0	0	0
	32-60	10-18	4-10	7.9-8.4	1-5	0	0.0-2.0	0
186:								
Moskee	0-4	10-18	11-15	6.6-7.3	0	0	0	0
	4-16	20-35	14-22	6.6-8.4	0	0	0	0
	16-60	10-18	5-13	7.9-8.4	1-5	0	0.0-2.0	0
187:								
Nuncho	0-12	20-27	17-20	6.6-7.3	0	0	0	0
	12-30	35-45	22-27	6.6-7.8	0	0	0	0
	30-60	28-40	15-20	7.9-8.4	5-15	0	0.0-2.0	0-5

Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Cation exchange capacity	Soil reaction	Calcium carbon- ate	Gypsum	Salinity	Sodium adsorp- tion ratio
	In	Pct	meq/100 g	pH	Pct	Pct	mmhos/cm	
188:								
Orpha----------------	0-4	5-9	5-9	6.6-7.8	0	0	0	0
	4-60	5-9	2-5	6.6-7.8	0	0	0	0
Tullock--------------	0-8	2-6	4-7	6.6-7.8	0-2	0	0	0
	8-30	2-8	1-4	7.4-8.4	1-5	0	0.0-2.0	0
	30-60	---	---	---	---	---	---	---
189:								
Oshoto---------------	0-7	15-25	12-20	6.6-7.8	0	0	0	0
	7-32	28-35	15-20	6.6-8.4	0	0	0	0
	32-60	20-35	15-20	7.4-8.4	5-15	0	0.0-2.0	0-5
Moorhead-------------	0-5	20-27	15-18	6.6-7.3	0	0	0	0
	5-35	35-50	20-27	6.6-8.4	0	0	0	0
	35-60	30-42	16-22	7.9-8.4	5-15	0-1	0.0-2.0	0-5
190:								
Parmleed-------------	0-3	15-25	12-15	6.6-7.3	0	0	0	0
	3-21	35-50	20-26	6.6-8.4	0	0	0	0
	21-27	25-40	10-20	7.9-8.4	5-15	0-1	0.0-2.0	0-5
	27-60	---	---	---	---	---	---	---
Renohill-------------	0-4	28-35	16-20	6.6-7.3	0	0	0	0
	4-24	35-50	19-27	7.4-8.4	0	0	0	0
	24-35	30-40	15-20	7.9-8.4	5-15	0-1	0.0-2.0	0-5
	35-60	---	---	---	---	---	---	---
191:								
Pits-----------------	---	---	---	---	---	---	---	---
Dumps----------------	---	---	---	---	---	---	---	---
192:								
Platmak--------------	0-4	15-25	9-19	6.6-7.3	0	0	0	0
	4-27	35-50	18-27	6.6-8.4	0	0	0	0
	27-60	30-40	15-23	7.9-8.4	5-15	0-1	0.0-2.0	0-5
193:								
Pugsley--------------	0-3	10-18	7-11	6.6-7.3	0	0	0	0
	3-13	20-30	12-19	6.6-7.8	0	0	0	0
	13-25	8-18	4-10	7.4-7.8	0-2	0	0.0-2.0	0
	25-60	---	---	---	---	---	---	---
Decolney-------------	0-3	10-18	10-14	6.6-7.3	0	0	0	0
	3-22	20-35	12-16	6.6-7.8	0	0	0	0
	22-43	10-18	8-14	7.4-7.9	0	0	0	0
	43-60	10-18	6-12	7.9-8.4	1-5	0	0.0-2.0	0
194:								
Pugsley--------------	0-3	10-18	7-11	6.6-7.3	0	0	0	0
	3-13	20-30	12-19	6.6-7.8	0	0	0	0
	13-25	8-18	4-10	7.4-7.8	0-2	0	0.0-2.0	0
	25-60	---	---	---	---	---	---	---
Decolney-------------	0-3	10-18	10-14	6.6-7.3	0	0	0	0
	3-22	20-35	12-16	6.6-7.8	0	0	0	0
	22-43	10-18	8-14	7.4-7.9	0	0	0	0
	43-60	10-18	6-12	7.9-8.4	1-5	0	0.0-2.0	0

Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Cation exchange capacity	Soil reaction	Calcium carbon-ate	Gypsum	Salinity	Sodium adsorp-tion ratio
	In	Pct	meq/100 g	pH	Pct	Pct	mmhos/cm	
195:								
Rauzi----------------	0-3	10-18	10-14	6.6-7.3	0	0	0	0
	3-30	20-35	12-20	6.6-7.8	0	0	0	0
	30-60	10-25	6-12	7.4-7.8	0-2	0	0.0-2.0	0
196:								
Rauzi----------------	0-6	20-25	14-16	6.6-7.3	0	0	0	0
	6-30	20-35	12-20	6.6-7.8	0	0	0	0
	30-60	10-18	6-12	7.9-8.4	0-2	0	0.0-2.0	0
197:								
Rauzi----------------	0-3	10-20	10-14	6.6-7.3	0	0	0	0
	3-30	20-35	12-20	6.6-7.8	0	0	0	0
	30-60	10-25	6-12	7.4-7.8	0-2	0	0.0-2.0	0
Elwop----------------	0-4	10-18	7-16	6.6-7.3	0	0	0	0
	4-24	20-35	11-19	6.6-7.8	0	0	0	0
	24-35	8-18	4-10	7.9-8.4	1-5	0	0.0-2.0	0
	35-60	---	---	---	---	---	---	---
198:								
Recluse--------------	0-5	15-25	9-19	6.6-7.3	0	0	0	0
	5-23	25-35	13-20	6.6-8.4	0	0	0	0
	23-60	15-30	7-16	7.9-8.4	5-15	0	0.0-2.0	0-5
199:								
Renohill-------------	0-3	28-35	16-20	6.6-7.3	0	0	0	0
	3-24	35-50	19-27	7.4-8.4	0	0	0	0
	24-36	30-40	15-20	7.9-8.4	5-15	0-1	0.0-2.0	0-5
	36-60	---	---	---	---	---	---	---
Savageton------------	0-4	35-40	21-23	7.4-8.4	0	0	0	0
	4-22	35-50	19-27	7.9-8.4	1-8	0	0	0
	22-36	35-50	19-27	7.9-8.4	5-15	0-1	0.0-2.0	0-5
	36-60	---	---	---	---	---	---	---
200:								
Renohill-------------	0-3	28-35	16-20	6.6-7.3	0	0	0	0
	3-24	35-50	19-27	7.4-8.4	0	0	0	0
	24-36	30-40	15-20	7.9-8.4	5-15	0-1	0.0-2.0	0-5
	36-60	---	---	---	---	---	---	---
Savageton------------	0-4	35-40	21-23	7.4-8.4	0	0	0	0
	4-22	35-50	19-27	7.9-8.4	1-8	0	0	0
	22-36	35-50	19-27	7.9-8.4	5-15	0-1	0.0-2.0	0-5
	36-60	---	---	---	---	---	---	---
201:								
Renohill-------------	0-4	28-35	16-20	6.6-7.3	0	0	0	0
	4-20	35-50	19-27	7.4-8.4	0	0	0	0
	20-30	30-40	15-20	7.9-8.4	5-15	0-1	0.0-2.0	0-5
	30-60	---	---	---	---	---	---	---
Shingle--------------	0-1	15-25	11-19	7.4-8.4	0-5	0	0	0
	1-12	20-35	10-17	7.9-8.4	5-10	0	0.0-2.0	0-5
	12-60	---	---	---	---	---	---	---
Worf-----------------	0-1	15-25	11-16	6.6-7.8	0	0	0	0
	1-10	20-35	14-19	6.6-7.8	0	0	0	0
	10-14	18-30	10-15	7.9-8.4	5-10	0	0.0-2.0	0-5
	14-60	---	---	---	---	---	---	---

Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Cation exchange capacity	Soil reaction	Calcium carbon- ate	Gypsum	Salinity	Sodium adsorp- tion ratio
	In	Pct	meq/100 g	pH	Pct	Pct	mmhos/cm	
202:								
Renohill-------------	0-4	28-35	16-20	6.6-7.3	0	0	0	0
	4-20	35-50	19-27	7.4-8.4	0	0	0	0
	20-30	30-40	15-20	7.9-8.4	5-15	0-1	0.0-2.0	0-5
	30-60	---	---	---	---	---	---	---
Worfka---------------	0-2	28-35	18-21	6.6-7.8	0	0	0	0
	2-13	35-50	20-26	7.4-8.4	0	0	0	0
	13-19	28-40	12-17	7.9-8.4	5-15	0-1	0.0-2.0	0-5
	19-60	---	---	---	---	---	---	---
203:								
Rockypoint-----------	0-3	15-25	14-18	6.6-7.8	0-5	0	0.0-2.0	0
	3-60	15-35	12-19	7.4-8.4	1-10	0-1	4.0-8.0	0-5
Iwait----------------	0-2	15-25	13-18	6.6-8.4	0-5	0	0	0
	2-60	20-35	11-18	7.9-8.4	5-15	0	2.0-4.0	0-5
204:								
Samday---------------	0-2	30-40	17-23	6.6-8.4	0-5	0	0.0-2.0	0
	2-16	35-50	18-26	7.4-8.4	5-10	0-1	2.0-4.0	0-5
	16-60	---	---	---	---	---	---	---
Samday, cool---------	0-1	30-40	17-23	6.6-8.4	0-5	0	0.0-2.0	0
	1-10	35-50	18-26	7.4-8.4	5-10	0-1	2.0-4.0	0-5
	10-60	---	---	---	---	---	---	---
Shingle--------------	0-3	28-35	16-23	6.6-8.4	0-1	0	0	0
	3-16	20-35	10-17	7.9-8.4	5-10	0	0.0-2.0	0-5
	16-60	---	---	---	---	---	---	---
205:								
Samday---------------	0-2	30-40	17-23	6.6-8.4	0-5	0	0.0-2.0	0
	2-16	35-50	18-26	7.4-8.4	5-10	0-1	2.0-4.0	0-5
	16-60	---	---	---	---	---	---	---
Savageton------------	0-5	35-40	21-23	7.4-8.4	0	0	0	0
	5-15	35-50	19-27	7.9-8.4	1-8	0	0	0
	15-28	35-50	19-27	7.9-8.4	5-15	0-1	0.0-2.0	0-5
	28-60	---	---	---	---	---	---	---
206:								
Samday---------------	0-2	30-40	17-23	6.6-8.4	0-5	0	0.0-2.0	0
	2-16	35-50	18-26	7.4-8.4	5-10	0-1	2.0-4.0	0-5
	16-60	---	---	---	---	---	---	---
Shingle--------------	0-2	15-25	9-16	6.6-8.4	0-5	0	0	0
	2-12	20-35	10-18	7.9-8.4	5-10	0	0.0-2.0	0-5
	12-60	---	---	---	---	---	---	---
Badland--------------	0-60	---	---	---	---	---	---	---
207:								
Cromack--------------	0-6	30-40	17-26	6.6-8.4	0-3	0	0	0
	6-14	35-50	18-27	7.4-8.4	0-10	0	0	0
	14-29	30-50	15-26	7.9-8.4	5-15	0-1	0.0-2.0	0-5
	29-60	---	---	---	---	---	---	---
Fairburn-------------	0-4	15-25	9-19	6.6-8.4	0-5	0	0	0
	4-15	20-35	11-19	7.4-8.4	5-15	0	0.0-2.0	0-5
	15-60	---	---	---	---	---	---	---

Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Cation exchange capacity	Soil reaction	Calcium carbon-ate	Gypsum	Salinity	Sodium adsorp-tion ratio
	In	Pct	meq/100 g	pH	Pct	Pct	mmhos/cm	
207:(cont.)								
Ucross	0-5	15-25	14-18	6.6-8.4	0-5	0	0	0
	5-31	20-35	12-18	7.4-8.4	5-15	0	0.0-2.0	0-5
	31-60	---	---	---	---	---	---	---
208:								
Savageton	0-4	35-40	21-23	7.4-8.4	0	0	0	0
	4-12	35-50	19-27	7.9-8.4	1-8	0	0	0
	12-38	35-50	19-27	7.9-8.4	5-15	0-1	0.0-2.0	0-5
	38-60	---	---	---	---	---	---	---
Silhouette	0-2	30-40	19-22	7.4-7.8	0-5	0	0	0
	2-28	35-45	18-23	7.4-8.4	1-5	0	0	0
	28-60	35-45	18-23	7.9-8.4	3-10	0	0.0-2.0	0-5
209:								
Savageton	0-3	35-40	21-23	7.4-8.4	0	0	0	0
	3-19	35-50	19-27	7.9-8.4	1-8	0	0	0
	19-36	35-50	19-27	7.9-8.4	5-15	0-1	0.0-2.0	0-5
	36-60	---	---	---	---	---	---	---
Silhouette	0-3	30-40	19-22	7.4-7.8	0-5	0	0	0
	3-15	35-45	18-23	7.4-8.4	1-5	0	0	0
	15-60	35-45	18-23	7.9-8.4	3-10	0-1	0.0-4.0	0-5
210:								
Shingle	0-2	15-25	9-16	6.6-8.4	0-5	0	0	0
	2-12	20-35	10-18	7.9-8.4	5-10	0	0.0-2.0	0-5
	12-60	---	---	---	---	---	---	---
Taluce	0-2	10-18	7-13	6.6-8.4	0-3	0	0	0
	2-18	8-18	5-10	7.9-8.4	1-5	0	0.0-2.0	0
	18-60	---	---	---	---	---	---	---
211:								
Shingle	0-1	15-25	11-19	7.4-8.4	0-5	0	0	0
	1-12	20-35	10-17	7.9-8.4	5-10	0	0.0-2.0	0-5
	12-60	---	---	---	---	---	---	---
Worf	0-1	15-25	11-16	6.6-7.8	0	0	0	0
	1-10	20-35	14-19	6.6-7.8	0	0	0	0
	10-14	18-30	10-15	7.9-8.4	5-10	0	0.0-2.0	0-5
	14-60	---	---	---	---	---	---	---
212:								
Teckla	0-10	10-20	9-13	6.6-7.3	0	0	0	0
	10-23	20-35	12-19	6.6-7.8	0	0	0	0
	23-31	20-35	12-19	6.6-7.8	0	0	0	0
	31-45	10-25	7-12	7.9-9.0	5-15	0	0	2-10
	45-60	5-15	3-6	6.6-8.4	0-5	0	0	2-10
213:								
Terro	0-3	10-18	6-9	6.6-7.8	0	0	0	0
	3-19	10-18	6-10	6.6-7.8	0	0	0	0
	19-38	8-18	3-6	7.4-8.4	1-5	0	0.0-2.0	0
	38-60	---	---	---	---	---	---	---
Taluce	0-2	10-18	5-11	7.4-8.4	0-5	0	0	0
	2-14	8-18	5-9	7.9-8.4	1-5	0	0.0-2.0	0
	14-60	---	---	---	---	---	---	---

Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Cation exchange capacity	Soil reaction	Calcium carbon-ate	Gypsum	Salinity	Sodium adsorp-tion ratio
	In	Pct	meq/100 g	pH	Pct	Pct	mmhos/cm	
214:								
Theedle	0-4	15-25	11-18	6.6-8.4	0-5	0	0	0
	4-36	20-35	10-16	7.4-8.4	5-15	0	0.0-2.0	0-5
	36-60	---	---	---	---	---	---	---
Kishona	0-4	15-25	9-16	6.6-8.4	0-5	0	0	0
	4-60	20-35	10-17	7.9-8.4	5-15	0	0.0-2.0	0-5
215:								
Theedle	0-4	15-25	11-18	6.6-8.4	0-5	0	0	0
	4-36	20-35	10-16	7.4-8.4	5-15	0	0.0-2.0	0-5
	36-60	---	---	---	---	---	---	---
Kishona	0-4	15-25	9-16	6.6-8.4	0-5	0	0	0
	4-60	20-35	10-17	7.9-8.4	5-15	0	0.0-2.0	0-5
216:								
Theedle	0-2	15-25	11-18	6.6-8.4	0-5	0	0	0
	2-28	20-35	10-16	7.4-8.4	5-15	0	0.0-2.0	0-5
	28-60	---	---	---	---	---	---	---
Kishona	0-4	15-25	9-16	6.6-8.4	0-5	0	0	0
	4-60	20-35	10-17	7.9-8.4	5-15	0	0.0-2.0	0-5
Shingle	0-2	15-25	9-16	6.6-8.4	0-5	0	0	0
	2-12	20-35	10-18	7.9-8.4	5-10	0	0.0-2.0	0-5
	12-60	---	---	---	---	---	---	---
217:								
Theedle	0-2	15-25	11-18	6.6-8.4	0-5	0	0	0
	2-28	20-35	10-16	7.4-8.4	5-15	0	0.0-2.0	0-5
	28-60	---	---	---	---	---	---	---
Shingle	0-2	15-25	9-16	6.6-8.4	0-5	0	0	0
	2-12	20-35	10-18	7.9-8.4	5-10	0	0.0-2.0	0-5
	12-60	---	---	---	---	---	---	---
218:								
Theedle	0-3	15-25	11-18	6.6-8.4	0-5	0	0	0
	3-35	20-35	10-16	7.4-8.4	5-15	0	0.0-2.0	0-5
	35-60	---	---	---	---	---	---	---
Turnercrest	0-2	8-15	7-11	7.4-8.4	0-4	0	0	0
	2-34	10-18	7-11	7.9-8.4	1-5	0	0.0-2.0	0
	34-60	---	---	---	---	---	---	---
Kishona	0-4	15-25	9-16	7.4-8.4	0-1	0	0	0
	4-60	20-35	10-17	7.9-8.4	5-15	0	0.0-2.0	0-5
219:								
Torriarents	0-4	20-40	11-21	6.6-8.4	1-5	0-1	0.0-2.0	0-5
	4-60	20-40	10-20	6.6-8.4	1-10	0-1	2.0-4.0	0-5
Torriorthents	0-5	20-40	11-21	6.6-8.4	1-5	0-1	0.0-2.0	0-5
	5-60	20-40	10-20	6.6-8.4	1-10	0-1	2.0-4.0	0-5
220:								
Pitchdraw	0-4	8-15	6-12	7.4-7.8	0-4	0	0	0
	4-31	10-18	5-9	7.9-8.4	1-5	0	0	0
	31-60	---	---	---	---	---	---	---

Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Cation exchange capacity	Soil reaction	Calcium carbon-ate	Gypsum	Salinity	Sodium adsorp-tion ratio
	In	Pct	meq/100 g	pH	Pct	Pct	mmhos/cm	
220: (cont.)								
Ashollow	0-5	8-18	6-15	7.4-8.4	0-2	0	0	0
	5-60	8-18	3-10	7.4-8.4	1-5	0	0.0-2.0	0
Niobrara	0-3	2-8	2-5	6.6-7.8	0-1	0	0	0
	3-12	2-8	1-4	6.6-7.8	0	0	0	0
	12-60	---	---	---	---	---	---	---
221:								
Turnercrest	0-2	8-18	7-11	6.6-8.4	0-3	0	0	0
	2-32	8-18	7-11	7.4-8.4	1-5	0	0.0-2.0	0
	32-60	---	---	---	---	---	---	---
Keeline	0-4	8-18	6-11	6.6-8.4	0-1	0	0	0
	4-60	8-18	5-9	7.9-8.4	1-5	0	0.0-2.0	0
Taluce	0-2	8-18	5-11	6.6-8.4	0-3	0	0.0-2.0	0
	2-14	10-18	5-9	7.4-9.0	1-5	0	0.0-2.0	0
	14-60	---	---	---	---	---	---	---
222:								
Turnercrest	0-3	4-8	5-7	7.4-8.4	0-4	0	0	0
	3-22	10-18	7-11	7.9-8.4	1-5	0	0.0-2.0	0
	22-60	---	---	---	---	---	---	---
Wibaux, thin solum	0-3	15-25	11-16	6.6-7.8	0	0	0	0
	3-9	15-25	9-14	6.6-7.8	0	0	0	0
	9-60	0-2	0-0	---	0-1	0	0	0
Taluce	0-2	10-18	5-11	7.4-8.4	0-5	0	0	0
	2-14	8-18	5-9	7.9-8.4	1-5	0	0.0-2.0	0
	14-60	---	---	---	---	---	---	---
223:								
Ucross	0-5	15-25	14-18	6.6-8.4	0-5	0	0	0
	5-31	20-35	12-18	7.4-8.4	5-15	0	0.0-2.0	0-5
	31-60	---	---	---	---	---	---	---
224:								
Ucross	0-5	15-25	14-18	6.6-8.4	0-5	0	0	0
	5-31	20-35	12-18	7.4-8.4	5-15	0	0.0-2.0	0-5
	31-60	---	---	---	---	---	---	---
Iwait	0-6	15-25	9-19	6.6-8.4	0-5	0	0	0
	6-60	20-35	10-18	7.9-8.4	5-15	0	0.0-2.0	0-5
225:								
Ucross	0-5	15-25	14-18	6.6-8.4	0-5	0	0	0
	5-31	20-35	12-18	7.4-8.4	5-15	0	0.0-2.0	0-5
	31-60	---	---	---	---	---	---	---
Iwait	0-6	15-25	9-19	6.6-8.4	0-5	0	0	0
	6-60	20-35	10-18	7.9-8.4	5-15	0	0.0-2.0	0-5
Fairburn	0-4	15-25	9-19	6.6-8.4	0-5	0	0	0
	4-15	20-35	11-19	7.4-8.4	5-15	0	0.0-2.0	0-5
	15-60	---	---	---	---	---	---	---

Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Cation exchange capacity	Soil reaction	Calcium carbon-ate	Gypsum	Salinity	Sodium adsorp-tion ratio
	In	Pct	meq/100 g	pH	Pct	Pct	mmhos/cm	
226:								
Ulm------------------	0-2	15-25	13-18	6.6-7.3	0	0	0	0
	2-25	35-50	20-27	6.6-8.4	0	0	0	0
	25-60	25-40	14-18	7.9-8.4	5-15	0-1	0.0-2.0	0-5
227:								
Ulm------------------	0-4	28-35	18-22	6.6-7.3	0	0	0	0
	4-25	35-50	20-27	6.6-8.4	0	0	0	0
	25-60	25-40	14-18	7.9-8.4	5-15	0-1	0.0-2.0	0-5
228:								
Ulm------------------	0-4	28-35	16-24	6.6-7.3	0	0	0	0
	4-25	35-50	26-37	6.6-8.4	0	0	0	0
	25-60	30-45	14-32	7.9-8.4	5-15	0-1	0.0-2.0	0-5
Renohill-------------	0-4	28-35	16-24	6.6-7.8	0	0	0	0
	4-24	35-50	26-37	6.6-8.4	0	0	0	0
	24-35	30-45	14-32	7.9-8.4	5-15	0-1	0.0-2.0	0-5
	35-60	---	---	---	---	---	---	---
229:								
Ulm------------------	0-4	28-35	16-24	6.6-7.3	0	0	0	0
	4-25	35-50	26-37	6.6-8.4	0	0	0	0
	25-60	30-45	14-32	7.9-8.4	5-15	0-1	0.0-2.0	0-5
Renohill-------------	0-4	28-35	16-24	6.6-7.8	0	0	0	0
	4-24	35-50	26-37	6.6-8.4	0	0	0	0
	24-35	28-45	14-32	7.9-8.4	5-15	0-1	0.0-2.0	0-5
	35-60	---	---	---	---	---	---	---
230:								
Urban land-----------	---	---	---	---	---	---	---	---
Deekay---------------	0-4	15-25	9-19	6.6-7.3	0	0	0	0
	4-23	25-35	13-20	6.6-8.4	0	0	0	0
	23-60	20-30	7-16	7.9-8.4	5-15	0	0.0-2.0	0-5
Moorhead-------------	0-6	28-35	18-22	6.6-7.3	0	0	0	0
	6-24	35-50	20-27	6.6-8.4	0	0	0	0
	24-60	30-42	16-22	7.9-8.4	5-15	0-1	0.0-2.0	0-5
231:								
Urban land-----------	---	---	---	---	---	---	---	---
Leiter---------------	0-3	28-35	16-24	6.6-7.8	0	0	0	0
	3-22	35-50	26-37	6.6-8.4	0	0	0	0
	22-33	28-45	14-32	7.9-8.4	5-15	0-1	0.0-2.0	0-5
	33-60	---	---	---	---	---	---	---
Moorhead-------------	0-4	28-35	16-24	6.6-7.8	0	0	0	0
	4-24	35-50	26-37	6.6-8.4	0	0	0	0
	24-60	30-45	14-32	7.9-8.4	5-15	0-1	0.0-2.0	0-5
232:								
Urban land-----------	---	---	---	---	---	---	---	---
Pitchdraw------------	0-4	8-15	6-12	7.4-7.8	0-4	0	0	0
	4-31	10-18	5-9	7.9-8.4	1-5	0	0	0
	31-60	---	---	---	---	---	---	---

Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Cation exchange capacity	Soil reaction	Calcium carbon-ate	Gypsum	Salinity	Sodium adsorp-tion ratio
	In	Pct	meq/100 g	pH	Pct	Pct	mmhos/cm	
232:(cont.)								
Ashollow	0-5	8-18	6-15	7.4-8.4	0-2	0	0	0
	5-60	6-18	3-10	7.4-8.4	1-4	0	0.0-2.0	0
233:								
Ustic Torriorthents	0-4	15-30	9-19	6.6-8.4	0-10	0	0.0-2.0	0-5
	4-35	15-30	9-19	6.6-8.4	1-10	0	0.0-2.0	0-5
	35-60	---	---	---	---	---	---	---
234:								
Ustic Torriorthents	0-4	15-30	9-19	6.6-8.4	0-10	0	0.0-2.0	0-5
	4-35	15-30	9-19	6.6-8.4	1-10	0	0.0-2.0	0-5
	35-60	---	---	---	---	---	---	---
Badland	0-60	---	---	---	---	---	---	---
235:								
Vonalee	0-3	10-18	7-10	6.6-7.8	0	0	0	0
	3-24	10-18	7-11	6.6-7.8	0	0	0	0
	24-60	8-18	2-6	7.9-8.4	1-5	0	0.0-2.0	0
236:								
Vonalee	0-3	10-18	5-13	6.6-7.8	0	0	0	0
	3-24	10-18	6-11	6.6-7.8	0	0	0	0
	24-60	8-18	4-10	7.4-8.4	1-5	0	0.0-2.0	0
Terro	0-3	10-18	5-13	6.6-7.8	0	0	0	0
	3-16	10-18	6-11	6.6-7.8	0	0	0	0
	16-30	8-18	4-10	7.4-8.4	1-5	0	0.0-2.0	0
	30-60	---	---	---	---	---	---	---
237:								
Vonalf	0-6	10-18	5-13	6.6-7.8	0	0	0	0
	6-34	10-18	6-11	6.6-7.8	0	0	0	0
	34-60	8-18	4-10	7.4-8.4	1-5	0	0.0-2.0	0
238:								
Vonalf	0-6	10-18	5-13	6.6-7.8	0	0	0	0
	6-34	10-18	6-11	6.6-7.8	0	0	0	0
	34-60	8-18	4-10	7.4-8.4	1-5	0	0.0-2.0	0
Xema	0-4	10-18	5-13	6.6-7.8	0	0	0	0
	4-22	10-18	6-11	6.6-7.8	0	0	0	0
	22-31	8-18	4-10	7.9-8.4	1-5	0	0.0-2.0	0
	31-60	---	---	---	---	---	---	---
239:								
Ironbutte	0-4	15-25	9-19	6.6-7.8	0	0	0	0
	4-12	10-25	5-14	6.6-8.4	0-3	0	0	0
	12-60	0-2	0-0	---	0-1	0	0	0
Fairburn	0-4	15-25	9-19	6.6-8.4	0-5	0	0	0
	4-15	20-35	11-19	7.4-8.4	5-15	0	0.0-2.0	0-5
	15-60	---	---	---	---	---	---	---
Mittenbutte	0-3	10-18	7-13	6.6-8.4	0-3	0	0	0
	3-16	8-18	5-10	7.9-8.4	1-5	0	0.0-2.0	0
	16-60	---	---	---	---	---	---	---

Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Cation exchange capacity	Soil reaction	Calcium carbon-ate	Gypsum	Salinity	Sodium adsorp-tion ratio
	In	Pct	meq/100 g	pH	Pct	Pct	mmhos/cm	
240:								
Wibaux---------------	0-3	10-20	11-16	6.6-7.8	0	0	0	0
	3-16	15-25	9-14	6.6-7.8	0	0	0	0
	16-60	0-2	0-0	---	0-1	0	0	0
Wibaux, thin solum---	0-3	15-25	11-16	6.6-7.8	0	0	0	0
	3-9	15-25	9-14	6.6-7.8	0	0	0	0
	9-60	0-2	---	---	0-1	0	0	0
241:								
Ironbutte------------	0-4	15-25	9-19	6.6-7.8	0	0	0	0
	4-12	10-25	5-14	6.6-8.4	0-3	0	0	0
	12-60	0-2	0-0	---	0-1	0	0	0
Ironbutte, thin solum	0-2	15-25	9-19	6.6-7.8	0	0	0	0
	2-10	10-25	5-14	6.6-8.4	0-3	0	0	0
	10-60	0-2	0-0	---	0-1	0	0	0
242:								
Ironbutte------------	0-4	15-25	9-19	6.6-7.8	0	0	0	0
	4-12	10-25	5-14	6.6-8.4	0-3	0	0	0
	12-60	0-2	0-0	---	0-1	0	0	0
Deekay---------------	0-4	15-25	9-19	6.6-7.3	0	0	0	0
	4-23	25-35	13-20	6.6-8.4	0	0	0	0
	23-60	20-30	7-16	7.9-8.4	5-15	0	0.0-2.0	0-5
Moorhead-------------	0-4	20-27	15-18	6.6-7.3	0	0	0	0
	4-26	35-50	20-27	6.6-8.4	0	0	0	0
	26-60	30-42	16-22	7.9-8.4	5-15	0	0.0-2.0	0-5
243:								
Wibaux, thick solum--	0-5	10-25	8-13	6.6-7.8	0	0	0	0
	5-23	10-25	6-11	7.9-8.4	0-5	0	0	0-5
	23-60	0-2	0-0	---	0-5	0	0	0
Wibaux---------------	0-3	10-20	9-14	6.6-7.8	0	0	0	0
	3-16	20-30	12-17	6.6-7.8	0	0	0	0
	16-60	0-2	0-0	---	0-1	0	0	0
244:								
Muleherder-----------	0-2	15-25	7-17	6.6-7.8	0	0	0	0
	2-16	10-25	6-15	6.6-8.4	0-5	0	0	0
	16-33	8-20	4-12	6.6-8.4	0-10	0	0.0-2.0	0-3
	33-60	0-2	0-0	---	0-5	0	0.0-2.0	0-3
Ironbutte------------	0-4	15-25	9-19	6.6-7.8	0	0	0	0
	4-12	10-25	5-14	6.6-8.4	0-3	0	0	0
	12-60	0-2	0-0	---	0-1	0	0	0
245:								
Wibaux---------------	0-4	15-25	11-16	6.6-7.8	0	0	0	0
	4-12	15-25	9-14	6.6-7.8	0	0	0	0
	12-60	0-2	0-0	---	0-1	0	0	0
Shingle--------------	0-1	15-25	11-19	7.4-8.4	0-5	0	0	0
	1-12	20-35	10-17	7.9-8.4	5-10	0	0.0-2.0	0-5
	12-60	---	---	---	---	---	---	---
Badland--------------	0-60	---	---	---	---	---	---	---

Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Cation exchange capacity	Soil reaction	Calcium carbon- ate	Gypsum	Salinity	Sodium adsorp- tion ratio
	In	Pct	meq/100 g	pH	Pct	Pct	mmhos/cm	
246:								
Wyarno---------------	0-3	28-35	18-21	6.6-7.3	0	0	0	0
	3-12	35-50	20-26	7.4-8.4	0	0	0	0
	12-60	30-40	14-20	7.9-8.4	5-15	0-1	0.0-2.0	0-5
Ulm------------------	0-4	28-35	18-22	6.6-7.3	0	0	0	0
	4-25	35-50	20-27	6.6-8.4	0	0	0	0
	25-60	25-40	14-18	7.9-8.4	5-15	0-1	0.0-2.0	0-5
247:								
Wyotite--------------	0-2	15-25	12-16	6.1-7.3	0	0	0	0
	2-38	28-35	15-19	6.1-8.4	0	0	0	0
	38-60	15-35	9-13	7.9-8.4	5-10	0	0.0-2.0	0-5
Ulm------------------	0-6	20-27	14-18	6.6-7.3	0	0	0	0
	6-23	35-50	20-27	6.6-8.4	0	0	0	0
	23-60	28-40	14-18	7.9-8.4	5-15	0-1	0.0-2.0	0-5
248:								
Ziggy----------------	0-5	15-25	9-19	6.6-7.8	0-1	0	0	0
	5-14	20-35	11-20	7.4-8.4	0-10	0	0	0
	14-60	20-35	10-18	7.9-8.4	5-15	0	0.0-2.0	0-5
Iwait----------------	0-6	15-25	9-19	6.6-8.4	0-5	0	0	0
	6-60	20-35	10-18	7.9-8.4	5-15	0	0.0-2.0	0-5
249:								
Ziggy----------------	0-5	15-25	9-19	6.6-7.8	0-1	0	0	0
	5-14	20-35	11-20	7.4-8.4	0-10	0	0	0
	14-60	20-35	10-18	7.9-8.4	5-15	0	0.0-2.0	0-5
Iwait----------------	0-6	15-25	9-19	6.6-8.4	0-5	0	0	0
	6-60	20-35	10-18	7.9-8.4	5-15	0	0.0-2.0	0-5
250:								
Ziggy----------------	0-5	15-25	9-19	6.6-7.8	0-1	0	0	0
	5-14	20-35	11-20	7.4-8.4	0-10	0	0	0
	14-60	20-35	10-18	7.9-8.4	5-15	0	0.0-2.0	0-5
Ucross---------------	0-5	15-25	14-18	6.6-8.4	0-5	0	0	0
	5-31	20-35	12-18	7.4-8.4	5-15	0	0.0-2.0	0-5
	31-60	---	---	---	---	---	---	---
Oldwolf--------------	0-3	15-25	9-19	6.6-7.3	0	0	0	0
	3-21	20-35	13-20	6.6-8.4	0	0	0	0
	21-32	20-35	7-16	7.9-8.4	5-15	0	0.0-2.0	0-5
	32-60	---	---	---	---	---	---	---

Soil Features

(Dashes (--) indicate that an assignment has not been made.)

Map symbol and soil name	Restrictive layer				Subsidence		Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Thickness	Hardness	Initial	Total		Uncoated steel	Concrete
		In	In		In	In			
100:									
Aridic Ustorthents, saline	---	---	---	---	0	---	Low	High	High
101:									
Arvada, thick surface	Natric	15-26	---	Noncemented	0	---	Low	High	High
102:									
Arvada, thick surface	Natric	15-26	---	Noncemented	0	---	Low	High	High
Arvada	Natric	15-26	---	Noncemented	0	---	Low	High	High
Slickspots	---	---	---	---	---	---	Low	High	High
103:									
Arwite	---	---	---	---	0	---	Moderate	High	Low
104:									
Arwite	---	---	---	---	0	---	Moderate	High	Low
105:									
Arwite	---	---	---	---	0	---	Moderate	High	Low
Elwop	Bedrock (paralithic)	20-40	---	Extremely weakly cemented	0	---	Moderate	High	Low
106:									
Arwite	---	---	---	---	0	---	Moderate	High	Low
Elwop	Bedrock (paralithic)	20-40	---	Extremely weakly cemented	0	---	Moderate	High	Low
107:									
Arwite	---	---	---	---	0	---	Moderate	High	Low
Vonalf	---	---	---	---	0	---	Moderate	High	Low
108:									
Arwite	---	---	---	---	0	---	Moderate	High	Low
Vonalf	---	---	---	---	0	---	Moderate	High	Low

Soil Features--Continued

Map symbol and soil name	Restrictive layer				Subsidence		Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Thickness	Hardness	Initial	Total		Uncoated steel	Concrete
		In	In		In	In			
109:									
Bidman	---	---	---	---	0	---	Low	High	Low
110:									
Bidman, loamy substratum	---	---	---	---	0	---	Low	High	Low
111:									
Bidman	---	---	---	---	0	---	Low	High	Low
Parmleed	Bedrock (paralithic)	20-40	---	Extremely weakly cemented	0	---	Low	High	Low
112:									
Bidman	---	---	---	---	0	---	Low	High	Low
Parmleed	Bedrock (paralithic)	20-40	---	Extremely weakly cemented	0	---	Low	High	Low
113:									
Bidman	--	---	---	---	0	---	Low	High	Low
Ulm	---	---	---	---	0	---	Low	High	Low
114:									
Bowbac	Bedrock (paralithic)	20-40	---	Extremely weakly cemented	0	---	Low	High	Low
Taluce	Bedrock (paralithic)	10-20	---	Extremely weakly cemented	0	---	Low	High	Low
Badland	Bedrock (paralithic)	0-0	---	Extremely weakly cemented	---	---	---	---	---
115:									
Bowbac	Bedrock (paralithic)	20-40	---	Extremely weakly cemented	0	---	Low	High	Low
Worf	Bedrock (paralithic)	10-20	---	Extremely weakly cemented	0	---	Low	High	Low

Soil Features--Continued

Map symbol and soil name	Restrictive layer				Subsidence		Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Thickness	Hardness	Initial	Total		Uncoated steel	Concrete
		In	In		In	In			
116:									
Cambria	---	--	---	---	0	---	Low	High	Low
Kishona	---	---	---	---	0	---	Low	High	Low
Zigweid	---	---	---	---	0	---	Low	High	Low
117:									
Cambria	---	---	---	---	0	---	Low	High	Low
Kishona	---	---	---	---	0	---	Low	High	Low
Zigweid	---		---	---	0	---	Low	High	Low
118:									
Clarkelen	---	---	---	---	0	---	Low	High	Low
Draknab	---	---	---	---	0	---	Low	High	Low
119:									
Clarkelen	---	---	---		0	---	Low	Moderate	Low
Embry	---	---	---	---	0	---	Low	High	Low
120:									
Clarkelen	---	---	---	---	0	---	Low	High	Low
Keeline	---	---	---	---	0	---	Low	High	Low
121:									
Cushman	Bedrock (paralithic)	20-40	---	Extremely weakly cemented	0	---	Low	High	Low
Cambria	---	---	---	---	0	---	Low	High	Low
122:									
Cushman	Bedrock (paralithic)	---	---	Extremely weakly cemented	0		Moderate	High	Low
Cambria	---	---	---	---	0	---	Moderate	High	Low
123:									
Cushman	Bedrock (paralithic)	20-40	---	Extremely weakly cemented	0	---	Low	High	Low

Soil Features--Continued

Map symbol and soil name	Restrictive layer: Kind	Restrictive layer: Depth to top	Restrictive layer: Thickness	Restrictive layer: Hardness	Subsidence: Initial	Subsidence: Total	Potential for frost action	Risk of corrosion: Uncoated steel	Risk of corrosion: Concrete
		In	In		In	In			
123:(cont.)									
Renohill----------------	Bedrock (paralithic)	20-40	---	Extremely weakly cemented	0	---	Low	High	Low
124:									
Cushman----------------	Bedrock (paralithic)	20-40	---	Extremely weakly cemented	0	---	Low	High	Low
Shingle----------------	Bedrock (paralithic)	10-20	---	Extremely weakly cemented	0	---	Low	High	Low
125:									
Cushman----------------	Bedrock (paralithic)	20-40	---	Extremely weakly cemented	0	---	Low	High	Low
Terro------------------	Bedrock (paralithic)	20-40	---	Extremely weakly cemented	0	---	Low	Moderate	Low
126:									
Cushman----------------	Bedrock (paralithic)	20-40	---	Extremely weakly cemented	0	---	Low	High	Low
Theedle----------------	Bedrock (paralithic)	20-40	---	Extremely weakly cemented	0	---	Low	High	Low
127:									
Cushman----------------	Bedrock (paralithic)	20-40	---	Extremely weakly cemented	0	---	Low	High	Low
Theedle----------------	Bedrock (paralithic)	20-40	---	Extremely weakly cemented	0	---	Low	High	Low
128:									
Cushman----------------	Bedrock (paralithic)	20-40	---	Extremely weakly cemented	0	---	Low	High	Low
Worf-------------------	Bedrock (paralithic)	10-20	---	Extremely weakly cemented	0	---	Low	High	Low
129:									
Decolney---------------	---	---	---	---	0	---	Low	High	Low
Hiland-----------------	---	---	---	---	0	---	Low	High	Low

Soil Features--Continued

Map symbol and soil name	Restrictive layer: Kind	Restrictive layer: Depth to top	Restrictive layer: Thickness	Restrictive layer: Hardness	Subsidence: Initial	Subsidence: Total	Potential for frost action	Risk of corrosion: Uncoated steel	Risk of corrosion: Concrete
		In	In		In	In			
130:									
Decolney	---	---	---	---	0	---	Low	High	Low
Hiland	---	---	---	---	0	---	Low	High	Low
131:									
Deekay	---	---	---	---	0	---	Moderate	High	Low
132:									
Deekay	---	---	---	---	0	---	Moderate	High	Low
Moorhead	---	---	---	---	0	---	Low	High	Low
133:									
Deekay	---	---	---	---	0	---	Moderate	High	Low
Moorhead	---	---	---	---	0	---	Low	High	Low
134:									
Deekay	---	---	---	---	0	---	Moderate	High	Low
Oldwolf	Bedrock (paralithic)	20-40	---	Extremely weakly cemented	0	---	Moderate	High	Low
135:									
Deekay	---	---	---	---	0	---	Moderate	High	Low
Oldwolf	Bedrock (paralithic)	20-40	---	Extremely weakly cemented	0	---	Moderate	High	Low
136:									
Deekay	---	---	---	---	0	---	Moderate	High	Low
Ziggy	---	---	---	---	0	---	Moderate	High	Low
137:									
Echeta	---	---	---	---	0	---	Low	High	Low
138:									
Echeta	---	---	---	---	0	---	Low	High	Low
Cromack	Bedrock (paralithic)	20-40	---	Extremely weakly cemented	0	---	Low	High	Low

Soil Features--Continued

Map symbol and soil name	Restrictive layer: Kind	Restrictive layer: Depth to top	Restrictive layer: Thickness	Restrictive layer: Hardness	Subsidence: Initial	Subsidence: Total	Potential for frost action	Risk of corrosion: Uncoated steel	Risk of corrosion: Concrete
		In	In		In	In			
139:									
Embry	---	---	---	---	0	---	Low	High	Low
Orpha	---	---	---	---	0	---	Low	Moderate	Low
140:									
Embry	---	---	---	---	0	---	Low	High	Low
Taluce	Bedrock (paralithic)	10-20	---	---	0	---	Low	High	Low
141:									
Emigha	---	---	---	---	0	---	Low	High	Low
142:									
Emigha, sodic	---	---	---	---	0	---	Low	High	High
Arvada, thick surface	Natric	12-30	---	Noncemented	0	---	Low	High	High
143:									
Felix, ponded	---	---	---	---	0	---	Moderate	High	Moderate
144:									
Forkwood	---	---	---	---	0	---	Moderate	High	Low
145:									
Forkwood	---	---	---	---	0	---	Low	High	Low
Cambria	---	---	---	---	0	---	Low	High	Low
146:									
Forkwood	---	---	---	---	0	---	Low	High	Low
Cushman	Bedrock (paralithic)	20-40	---	Extremely weakly cemented	0	---	Low	High	Low
147:									
Forkwood	---	---	---	---	0	---	Moderate	High	Low
Cushman	Bedrock (paralithic)	20-40	---	Extremely weakly cemented	0	---	Moderate	High	Low

Soil Features--Continued

Map symbol and soil name	Restrictive layer: Kind	Restrictive layer: Depth to top	Restrictive layer: Thickness	Restrictive layer: Hardness	Subsidence: Initial	Subsidence: Total	Potential for frost action	Risk of corrosion: Uncoated steel	Risk of corrosion: Concrete
		In	In		In	In			
148:									
Forkwood	---	---	---	---	0	---	Moderate	High	Low
Ulm	---	---	---	---	0	---	Low	High	Low
149:									
Forkwood	---	---	---	---	0	---	Low	High	Low
Ulm	---	---	---	---	0	---	Low	High	Low
150:									
Gateson	Bedrock (paralithic)	20-40	---	Extremely weakly cemented	0	---	Low	Moderate	Low
Taluce	Bedrock (paralithic)	10-20	---	Extremely weakly cemented	0	---	Low	High	Low
Turnercrest	Bedrock (paralithic)	20-40	---	Extremely weakly cemented	0	---	Low	High	Low
151:									
Haverdad	---	---	---	---	0	---	Moderate	High	Low
152:									
Haverdad	---	---	---	---	0	---	Low	High	Low
Clarkelen	---	---	---	---	0	---	Low	High	Low
153:									
Haverdad	---	---	---	---	0	---	Low	High	Low
Kishona	---	---	---	---	0	---	Low	High	Low
154:									
Heldt	---	---	---	---	0	---	Low	High	Low
155:									
Heldt, saline	---	---	---	---	0	---	Low	High	High
Bidman, saline	---	---	---	---	0	---	Low	High	High
156:									
Hiland	---	---	---	---	0	---	Low	High	Low

Soil Features--Continued

Map symbol and soil name	Restrictive layer: Kind	Restrictive layer: Depth to top	Restrictive layer: Thickness	Restrictive layer: Hardness	Subsidence: Initial	Subsidence: Total	Potential for frost action	Risk of corrosion: Uncoated steel	Risk of corrosion: Concrete
		In	In		In	In			
157:									
Hiland	---	---	---	---	0	---	Low	High	Low
Bowbac	Bedrock (paralithic)	20-40	---	Extremely weakly cemented	0	---	Low	High	Low
158:									
Hiland	---	---	---	---	0	---	Low	High	Low
Bowbac	Bedrock (paralithic)	20-40	---	Extremely weakly cemented	0	---	Low	High	Low
159:									
Hiland	---	---	---	---	0	---	Low	High	Low
Vonalee	---	---	---	---	0	---	Low	High	Low
160:									
Hiland	---	---	---	---	0	---	Low	High	Low
Vonalee	---	---	---	---	0	---	Low	High	Low
161:									
Hilight	Bedrock (paralithic)	10-20	---	Extremely weakly cemented	0	---	Low	High	Low
Taluce, cool	Bedrock (paralithic)	10-20	---	Extremely weakly cemented	0	---	Low	High	Low
Wags	Bedrock (paralithic)	20-40	---	Extremely weakly cemented	0	---	Low	High	Moderate
162:									
Lismas	Bedrock (paralithic)	10-20	---	Extremely weakly cemented	0	---	Low	High	High
Mittenbutte, cool	Bedrock (paralithic)	10-20	---	Extremely weakly cemented	0	---	Moderate	High	Low
Sabatka	Bedrock (paralithic)	20-40	---	Extremely weakly cemented	0	---	Low	High	High

Soil Features--Continued

Map symbol and soil name	Restrictive layer: Kind	Restrictive layer: Depth to top	Restrictive layer: Thickness	Restrictive layer: Hardness	Subsidence: Initial	Subsidence: Total	Potential for frost action	Risk of corrosion: Uncoated steel	Risk of corrosion: Concrete
		In	In		In	In			
163:									
Hilight	Bedrock (paralithic)	10-20	---	Extremely weakly cemented	0	---	Low	High	Low
Wags	Bedrock (paralithic)	20-40	---	Extremely weakly cemented	0	---	Low	High	Moderate
Badland	Bedrock (paralithic)	0-0	---	Extremely weakly cemented	---	---	---	---	---
164:									
Lismas	Bedrock (paralithic)	10-20	---	Extremely weakly cemented	0	---	Low	High	High
Sabatka	Bedrock (paralithic)	20-40	---	Extremely weakly cemented	0	---	Low	High	High
Badland	Bedrock (paralithic)	0-0	---	Extremely weakly cemented	---	---	---	---	---
165:									
Jayem	---	---	---	---	0	---	Low	High	Low
166:									
Jaywest	---	---	---	---	0	---	Low	High	Low
167:									
Jaywest	---	---	---	---	0	---	Low	High	Low
Moorhead	---	---	---	---	0	---	Low	High	Low
168:									
Jaywest	---	---	---	---	0	---	Low	High	Low
Spottedhorse	Bedrock (paralithic)	20-40	---	Extremely weakly cemented	0	---	Low	High	Low
169:									
Julesburg	---	---	---	---	0	---	Low	High	Low
170:									
Keeline	---	---	---	---	0	---	Moderate	High	Low
Tullock	Bedrock (paralithic)	20-40	---	Extremely weakly cemented	0	---	Low	High	Low

Soil Features--Continued

Map symbol and soil name	Restrictive layer: Kind	Restrictive layer: Depth to top	Restrictive layer: Thickness	Restrictive layer: Hardness	Subsidence: Initial	Subsidence: Total	Potential for frost action	Risk of corrosion: Uncoated steel	Risk of corrosion: Concrete
		In	In		In	In			
171:									
Keeline	---	---	---	---	0	---	Low	High	Low
Tullock	Bedrock (paralithic)	20-40	---	Extremely weakly cemented	0	---	Low	Moderate	Low
Niobrara, dry	Bedrock (paralithic)	10-20	---	Extremely weakly cemented	0	---	Low	Moderate	Low
172:									
Keyner	Natric	12-26		Noncemented	0	---	Low	High	High
173:									
Lawver	Strongly contrasting textural stratification	20-40	---	Noncemented	0	---	Low	High	Low
Teckla	Strongly contrasting textural stratification	20-40	---	Noncemented	0	---	Low	High	Low
Wibaux	Strongly contrasting textural stratification	10-20	---	Noncemented	0	---	Low	Moderate	Low
174:									
Brislawn	Strongly contrasting textural stratification	20-40	---	Noncemented	0	---	Low	High	Low
Rockybutte	Strongly contrasting textural stratification	20-40	---	Noncemented	0	---	Moderate	High	Low
Ironbutte	Strongly contrasting textural stratification	10-20	---	Noncemented	0	---	Low	High	Low

Soil Features--Continued

Map symbol and soil name	Restrictive layer: Kind	Restrictive layer: Depth to top	Restrictive layer: Thickness	Restrictive layer: Hardness	Subsidence: Initial	Subsidence: Total	Potential for frost action	Risk of corrosion: Uncoated steel	Risk of corrosion: Concrete
		In	In		In	In			
175:									
Lawver	Strongly contrasting textural stratification	20-40	---	Noncemented	0	---	Low	High	Low
Wibaux	Strongly contrasting textural stratification	10-20	---	Noncemented	0	---	Low	Moderate	Low
176:									
Leiter	Bedrock (paralithic)	20-40	---	Extremely weakly cemented	0	---	Low	High	Low
Cromack	Bedrock (paralithic)	20-40	---	Extremely weakly cemented	0	---	Low	High	Low
177:									
Maysdorf	---	---	---	---	0	---	Low	High	Low
178:									
Maysdorf		-	---	---	0	---	Low	High	Low
179:									
Maysdorf	---	---	---	---	0	---	Low	High	Low
Pugsley	Bedrock (paralithic)	20-40	---	Extremely weakly cemented	0	---	Low	High	Low
180:									
Maysdorf			---	---	0	---	Low	High	Low
Pugsley	Bedrock (paralithic)	20-40	---	Extremely weakly cemented	0	---	Low	High	Low
181:									
Moorhead	---	---	---	---	0	---	Low	High	Low
182:									
Moorhead	---	---	---	---	0	---	Low	High	Low

Soil Features--Continued

Map symbol and soil name	Restrictive layer				Subsidence		Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Thickness	Hardness	Initial	Total		Uncoated steel	Concrete
		In	In		In	In			
183:									
Moorhead	---	---	---	---	0	---	Low	High	Low
Leiter	Bedrock (paralithic)	20-40	---	Extremely weakly cemented	0	---	Low	High	Low
184:									
Moorhead	---	---	---	---	0	---	Low	High	Low
Leiter	Bedrock (paralithic)	20-40	---	Extremely weakly cemented	0	---	Low	High	Low
185:									
Moskee	---	---	---	---	0	---	Moderate	High	Low
186:									
Moskee	---	---	---	---	0	---	Low	High	Low
187:									
Nuncho	---	---	---	---	0	---	Low	High	Low
188:									
Orpha	---	---	---	---	0	---	Low	Moderate	Low
Tullock	Bedrock (paralithic)	20-40	---	Extremely weakly cemented	0	---	Low	Moderate	Low
189:									
Oshoto	---	---	---	---	0	---	Moderate	High	Low
Moorhead	---	---	---	---	0	---	Moderate	High	Low
190:									
Parmleed	Bedrock (paralithic)	20-40	---	Extremely weakly cemented	0	---	Low	High	Low
Renohill	Bedrock (paralithic)	20-40	---	Extremely weakly cemented	0	---	Low	High	Low
191:									
Pits	---	---	---	---	---	---	---	---	---
Dumps	---	---	---	---	---	---	---	---	---

Soil Features--Continued

Map symbol and soil name	Restrictive layer				Subsidence		Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Thickness	Hardness	Initial	Total		Uncoated steel	Concrete
		In	In		In	In			
192:									
Platmak-----------------	---	---	---	---	0	---	Low	High	Low
193:									
Pugsley-----------------	Bedrock (paralithic)	20-40	---	Extremely weakly cemented	0	---	Low	High	Low
Decolney----------------	---	---	---	---	0	---	Low	High	Low
194:									
Pugsley-----------------	Bedrock (paralithic)	20-40	---	Extremely weakly cemented	0	---	Low	High	Low
Decolney----------------	---	---	---	---	0	---	Low	High	Low
195:									
Rauzi-------------------	---	---	---	---	0	---	Moderate	High	Low
196:									
Rauzi-------------------	---	-	---	---	0	---	Moderate	High	Low
197:									
Rauzi-------------------	---	---	---	---	0	---	Moderate	High	Low
Elwop-------------------	Bedrock (paralithic)	20-40	---	Extremely weakly cemented	0	---	Moderate	High	Low
198:									
Recluse-----------------	---	---	---	---	0	---	Moderate	High	Low
199:									
Renohill----------------	Bedrock (paralithic)	20-40	---	Extremely weakly cemented	0	---	Low	High	Low
Savageton---------------	Bedrock (paralithic)	20-40	---	Extremely weakly cemented	0	---	Low	High	Low
200:									
Renohill----------------	Bedrock (paralithic)	20-40	---	Extremely weakly cemented	0	---	Low	High	Low
Savageton---------------	Bedrock (paralithic)	20-40	---	Extremely weakly cemented	0	---	Low	High	Low

Soil Features--Continued

Map symbol and soil name	Restrictive layer				Subsidence		Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Thickness	Hardness	Initial	Total		Uncoated steel	Concrete
		In	In		In	In			
201:									
Renohill	Bedrock (paralithic)	20-40	---	Extremely weakly cemented	0	---	Low	High	Low
Shingle	Bedrock (paralithic)	10-20	---	Extremely weakly cemented	0	---	Low	High	Low
Worf	Bedrock (paralithic)	10-20	---	Extremely weakly cemented	0	---	Low	High	Low
202:									
Renohill	Bedrock (paralithic)	20-40	---	Extremely weakly cemented	0	---	Low	High	Low
Worfka	Bedrock (paralithic)	10-20	---	Extremely weakly cemented	0	---	Low	High	Low
203:									
Rockypoint	---	---	---	---	0	---	Moderate	High	Low
Iwait	---	---	---	---	0	---	Moderate	High	Low
204:									
Samday	Bedrock (paralithic)	10-20	---	Extremely weakly cemented	0	---	Low	High	Low
Samday, cool	Bedrock (paralithic)	10-20	---	Extremely weakly cemented	0	---	Low	High	Low
Shingle	Bedrock (paralithic)	10-20	---	Extremely weakly cemented	0	---	Moderate	High	Low
205:									
Samday	Bedrock (paralithic)	10-20	---	Extremely weakly cemented	0	---	Low	High	Low
Savageton	Bedrock (paralithic)	20-40	---	Extremely weakly cemented	0	---	Low	High	Low
206:									
Samday	Bedrock (paralithic)	10-20	---	Extremely weakly cemented	0	---	Low	High	Low
Shingle	Bedrock (paralithic)	10-20	---	Extremely weakly cemented	0	---	Moderate	High	Low

Soil Features--Continued

Map symbol and soil name	Restrictive layer: Kind	Restrictive layer: Depth to top	Restrictive layer: Thickness	Restrictive layer: Hardness	Subsidence: Initial	Subsidence: Total	Potential for frost action	Risk of corrosion: Uncoated steel	Risk of corrosion: Concrete
		In	In		In	In			
206: (cont.)									
Badland	Bedrock (paralithic)	0-0	---	Extremely weakly cemented	---	---	---	---	---
207:									
Cromack	Bedrock (paralithic)	20-40	---	Extremely weakly cemented	0	---	Low	High	Low
Fairburn	Bedrock (paralithic)	10-20	---	Extremely weakly cemented	0	---	Moderate	High	Low
Ucross	Bedrock (paralithic)	20-40	---	Extremely weakly cemented	0	---	Moderate	High	Low
208:									
Savageton	Bedrock (paralithic)	20 40	---	Extremely weakly cemented	0	---	Low	High	Low
Silhouette	---	---	---	---	0	---	Low	High	Low
209:									
Savageton	Bedrock (paralithic)	20-40	---	Extremely weakly cemented	0	---	Low	High	Low
Silhouette	---	---	---	---	0	---	Low	High	Low
210:									
Shingle	Bedrock (paralithic)	10-20	---	Extremely weakly cemented	0		Moderate	High	Low
Taluce	Bedrock (paralithic)	10-20	---	Extremely weakly cemented	0	---	Moderate	High	Low
211:									
Shingle	Bedrock (paralithic)	10-20	---	Extremely weakly cemented	0	---	Low	High	Low
Worf	Bedrock (paralithic)	10-20	---	Extremely weakly cemented	0	---	Low	High	Low
212:									
Teckla	Strongly contrasting textural stratification	20 40	---	Noncemented	0	---	Low	High	Low

Soil Features--Continued

Map symbol and soil name	Restrictive layer: Kind	Restrictive layer: Depth to top	Restrictive layer: Thickness	Restrictive layer: Hardness	Subsidence: Initial	Subsidence: Total	Potential for frost action	Risk of corrosion: Uncoated steel	Risk of corrosion: Concrete
		In	In		In	In			
213:									
Terro	Bedrock (paralithic)	20-40	---	Extremely weakly cemented	0	--	Low	Moderate	Low
Taluce	Bedrock (paralithic)	10-20	-	Extremely weakly cemented	0	---	Low	High	Low
214:									
Theedle	Bedrock (paralithic)	20-40	---	Extremely weakly cemented	0	---	Low	High	Low
Kishona	---	---	---	- -	0	---	Moderate	High	Low
215:									
Theedle	Bedrock (paralithic)	20-40	---	Extremely weakly cemented	0	---	Moderate	High	Low
Kishona	---	---	---	---	0	---	Moderate	High	Low
216:									
Theedle	Bedrock (paralithic)	20-40	---	Extremely weakly cemented	0	---	Moderate	High	Low
Kishona	---	- -	---	---	0	---	Moderate	High	Low
Shingle	Bedrock (paralithic)	10-20	---	Extremely weakly cemented	0	---	Moderate	High	Low
217:									
Theedle	Bedrock (paralithic)	20-40	---	Extremely weakly cemented	0	---	Moderate	High	Low
Shingle	Bedrock (paralithic)	10-20	---	Extremely weakly cemented	0	---	Moderate	High	Low
218:									
Theedle	Bedrock (paralithic)	20-40	---	Extremely weakly cemented	0	--	Low	High	Low
Turnercrest	Bedrock (paralithic)	20-40	--	Extremely weakly cemented	0	---	Low	High	Low
Kishona	- -	---	---	---	0	---	Low	High	Low

Soil Features--Continued

Map symbol and soil name	Restrictive layer: Kind	Restrictive layer: Depth to top	Restrictive layer: Thickness	Restrictive layer: Hardness	Subsidence: Initial	Subsidence: Total	Potential for frost action	Risk of corrosion: Uncoated steel	Risk of corrosion: Concrete
		In	In		In	In			
219:									
Torriarents	---	---	---	---	0	---	Moderate	High	Low
Torriorthents	---	---	---	---	0	--	Moderate	High	Low
220:									
Pitchdraw	Bedrock (paralithic)	20-40	---	Extremely weakly cemented	0	---	Moderate	High	Low
Ashollow	---	---	---	---	0	---	Moderate	High	Low
Niobrara	Bedrock (paralithic)	10-20	---	Extremely weakly cemented	0	---	Low	High	Low
221:									
Turnercrest	Bedrock (paralithic)	---	20-40	Noncemented	0	---	Moderate	High	Low
Keeline	---	---	---	---	0	---	Moderate	High	Low
Taluce	Bedrock (paralithic)	---	40-50	---	0	---	Low	High	Low
222:									
Turnercrest	Bedrock (paralithic)	20-40	---	Extremely weakly cemented	0	---	Low	High	Low
Wibaux, thin solum	Strongly contrasting textural stratification	6-10	---	Noncemented	0	---	Low	Moderate	Low
Taluce	Bedrock (paralithic)	10-20	---	Extremely weakly cemented	0	---	Low	High	Low
223:									
Ucross	Bedrock (paralithic)	20-40	---	Extremely weakly cemented	0	---	Moderate	High	Low
224:									
Ucross	Bedrock (paralithic)	20-40	---	Extremely weakly cemented	0	---	Moderate	High	Low
Iwait	---	---	---	---	0	---	Moderate	High	Low

Soil Features--Continued

Map symbol and soil name	Restrictive layer: Kind	Restrictive layer: Depth to top	Restrictive layer: Thickness	Restrictive layer: Hardness	Subsidence: Initial	Subsidence: Total	Potential for frost action	Risk of corrosion: Uncoated steel	Risk of corrosion: Concrete
		In	In		In	In			
225:									
Ucross	Bedrock (paralithic)	20-40	---	Extremely weakly cemented	0	---	Moderate	High	Low
Iwait	---	---	---	---	0	---	Moderate	High	Low
Fairburn	Bedrock (paralithic)	10-20	---	Extremely weakly cemented	0	---	Moderate	High	Low
226:									
Ulm	---	---	---	---	0	---	Low	High	Low
227:									
Ulm	---	---	---	---	0	---	Low	High	Low
228:									
Ulm	---	---	---	---	0	---	Low	High	Low
Renohill	Bedrock (paralithic)	20-40	---	Extremely weakly cemented	0	---	Low	High	Low
229:									
Ulm	---	---	---	---	0	---	Low	High	Low
Renohill	Bedrock (paralithic)	---	---	Extremely weakly cemented	0	---	Low	High	Low
230:									
Urban land	---	---	---	---	---	---	---	---	---
Deekay	---	---	---	---	0	---	Moderate	High	Low
Moorhead	---	---	---	---	0	---	Moderate	High	Low
231:									
Urban land	---	---	---	---	--	---	---	---	---
Leiter	Bedrock (paralithic)	20-40	---	Extremely weakly cemented	0	---	Low	High	Low
Moorhead	---	---	---	---	0	---	Low	High	Low

Soil Features--Continued

Map symbol and soil name	Restrictive layer: Kind	Depth to top	Thickness	Hardness	Subsidence: Initial	Total	Potential for frost action	Risk of corrosion: Uncoated steel	Concrete
		In	In		In	In			
232:									
Urban land	---	---	---	---	---	---	---	---	---
Pitchdraw	Bedrock (paralithic)	20-40	---	Extremely weakly cemented	0	---	Low	High	Low
Ashollow	---	---	---	---	0	---	Moderate	High	Low
233:									
Ustic Torriorthents	Bedrock (paralithic)	20-60	---	Extremely weakly cemented	0	---	Moderate	High	Low
234:									
Ustic Torriorthents	Bedrock (paralithic)	20-60	---	Extremely weakly cemented	0	---	Moderate	High	Low
Badland	Bedrock (paralithic)	0-0	---	Extremely weakly cemented	---	---	---	---	---
235:									
Vonalee	---	---	---	---	0	---	Low	High	Low
236:									
Vonalee	---	---	---	---	0	---	Moderate	High	Low
Terro	Bedrock (paralithic)	20-40	---	Extremely weakly cemented	0	---	Low	High	Low
237:									
Vonalf	---	---	---	---	0	---	Moderate	High	Low
238:									
Vonalf	---	---	---	---	0	---	Moderate	High	Low
Xema	Bedrock (paralithic)	20-40	---	Extremely weakly cemented	0	---	Moderate	High	Low
239:									
Ironbutte	Strongly contrasting textural stratification	10-20	---	Noncemented	0	---	Low	High	Low
Fairburn	Bedrock (paralithic)	10-20	---	Extremely weakly cemented	0	---	Moderate	High	Low

Soil Features--Continued

Map symbol and soil name	Restrictive layer: Kind	Restrictive layer: Depth to top	Restrictive layer: Thickness	Restrictive layer: Hardness	Subsidence: Initial	Subsidence: Total	Potential for frost action	Risk of corrosion: Uncoated steel	Risk of corrosion: Concrete
		In	In		In	In			
239:(cont.)									
Mittenbutte	Bedrock (paralithic)	10-20	---	Extremely weakly cemented	0	---	Moderate	High	Low
240:									
Wibaux	Strongly contrasting textural stratification	---	---	Noncemented	0	---	Low	Moderate	Low
Wibaux, thin solum	Strongly contrasting textural stratification	6-10	---	Noncemented	0	---	Low	Moderate	Low
241:									
Ironbutte	Strongly contrasting textural stratification	10-20	---	Noncemented	0	---	Low	High	Low
Ironbutte, thin solum	Strongly contrasting textural stratification	6-10	---	Noncemented	0	---	Low	High	Low
242:									
Ironbutte	Strongly contrasting textural stratification	10-20	---	Noncemented	0	---	Low	High	Low
Deekay	---	---	---	---	0	---	Moderate	High	Low
Moorhead	---	---	---	---	0	---	Moderate	High	Low
243:									
Wibaux, thick solum	Strongly contrasting textural stratification	20-40	---	Noncemented	0	---	Low	High	Low

Soil Features--Continued

Map symbol and soil name	Restrictive layer				Subsidence		Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Thickness	Hardness	Initial	Total		Uncoated steel	Concrete
		In	In		In	In			
Wibaux	Strongly contrasting textural stratification	10-20	---	Noncemented	0	---	Low	Moderate	Low
244:									
Muleherder	Strongly contrasting textural stratification	20-40	---	Noncemented	0	---	Low	High	Low
Ironbutte	Strongly contrasting textural stratification	10-20	---	Noncemented	0	---	Low	High	Low
245:									
Wibaux	Strongly contrasting textural stratification	10-20	---	Noncemented	0	---	Low	Moderate	Low
Shingle	Bedrock (paralithic)	10-20	---	Extremely weakly cemented	0	---	Low	High	Low
Badland	Bedrock (paralithic)	0-0	---	Extremely weakly cemented	---	---	---	---	---
246:									
Wyarno	---	---	---	---	0	---	Low	High	Low
Ulm	---	---	---	---	0	---	Low	High	Low
247:									
Wyotite	---	---	---	---	0	---	Low	High	Low
Ulm	---	---	---	---	0	---	Low	High	Low
248:									
Ziggy	---	---	---	---	0	---	Moderate	High	Low
Iwait	---	---	---	---	0	---	Moderate	High	Low
249:									
Ziggy	---	---	---	---	0	---	Moderate	High	Low

Soil Features--Continued

Map symbol and soil name	Restrictive layer				Subsidence		Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Thickness	Hardness	Initial	Total		Uncoated steel	Concrete
		In	In		In	In			
249:(cont.)									
Iwait	---	---	---	---	0	---	Moderate	High	Low
250:									
Ziggy	---	---	---	---	0	---	Moderate	High	Low
Ucross	Bedrock (paralithic)	20-40	---	Extremely weakly cemented	0	---	Moderate	High	Low
Oldwolf	Bedrock (paralithic)	20-40	---	Extremely weakly cemented	0	---	Moderate	High	Low

Water Features

(Dashes (--) indicate that an assignment has not been made. Depths of layers are in feet.)

Map symbol and soil name	Hydro-logic group	Month	Water Table: Upper limit	Water Table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
100:									
Aridic Ustorthents, saline	B								
		All months	---	---	---	---	---	---	---
101:									
Arvada, thick surface-----	D								
		All months	---	---	---	---	---	---	---
102:									
Arvada, thick surface-----	D								
		All months	---	---	---	---	---	---	---
Arvada--------------------	D								
		All months	---	---	---	---	---	---	---
103:									
Arwite--------------------	B								
		All months	---	---	---	---	---	---	---
104:									
Arwite--------------------	B								
		All months	---	---	---	---	---	---	---
105:									
Arwite--------------------	B								
		All months	---	---	---	---	---	---	---
Elwop---------------------	C								
		All months	---	---	---	---	---	---	---
106:									
Arwite--------------------	B								
		All months	---	---	---	---	---	---	---
Elwop---------------------	C								
		All months	---	---	---	---	---	---	---
107:									
Arwite--------------------	B								
		All months	---	---	---	---	---	---	---
Vonalf--------------------	B								
		All months	---	---	---	---	---	---	---
108:									
Arwite--------------------	B								
		All months	---	---	---	---	---	---	---
Vonalf--------------------	B								
		All months	---	---	---	---	---	---	---
109:									
Bidman--------------------	C								
		All months	---	---	---	---	---	---	---
110:									
Bidman, loamy substratum--	C								
		All months	---	---	---	---	---	---	---

Water Features--Continued

Map symbol and soil name	Hydro-logic group	Month	Water Table: Upper limit	Water Table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
111:									
Bidman	C	All months	---	---	---	---	---	---	---
Parmleed	C	All months	---	---	---	---	---	---	---
112:									
Bidman	C	All months	---	---	---	---	---	---	---
Parmleed	C	All months	---	---	---	---	---	---	---
113:									
Bidman	C	All months	---	---	---	---	---	---	---
Ulm	C	All months	---	---	---	---	---	---	---
114:									
Bowbac	C	All months	---	---	---	---	---	---	---
Taluce	D	All months	---	---	---	---	---	---	---
Badland	D	All months	---	---	---	---	---	---	---
115:									
Bowbac	C	All months	---	---	---	---	---	---	---
Worf	D	All months	---	---	---	---	---	---	---
116:									
Cambria	B	All months	---	---	---	---	---	---	---
Kishona	B	All months	---	---	---	---	---	---	---
Zigweid	B	All months	---	---	---	---	---	---	---
117:									
Cambria	B	All months	---	---	---	---	---	---	---
Kishona	B	All months	---	---	---	---	---	---	---
Zigweid	B	All months	---	---	---	---	---	---	---

Water Features--Continued

Map symbol and soil name	Hydro-logic group	Month	Water Table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
118:									
Clarkelen----------------	B								
		April	---	---	---	---	None	Very brief	Occasional
		May	---	---	---	---	None	Very brief	Occasional
		June	---	---	---	---	None	Very brief	Occasional
		July	---	---	---	---	None	Very brief	Rare
Draknab------------------	A								
		April	---	---	---	---	None	Very brief	Occasional
		May	---	---	---	---	None	Very brief	Occasional
		June	---	---	---	---	None	Very brief	Occasional
		July	---	---	---	---	None	Very brief	Rare
119:									
Clarkelen----------------	B								
		April	---	---	---	---	None	Very brief	Occasional
		May	---	---	---	---	None	Very brief	Occasional
		June	---	---	---	---	None	Very brief	Occasional
		July	---	---	---	---	None	Very brief	Rare
Embry--------------------	B								
		All months	---	---	---	---	---	---	---
120:									
Clarkelen----------------	B								
		April	---	---	---	---	None	Very brief	Occasional
		May	---	---	---	---	None	Very brief	Occasional
		June	---	---	---	---	None	Very brief	Occasional
		July	---	---	---	---	None	Very brief	Rare
Keeline------------------	B								
		All months	---	---	---	---	---	---	---
121:									
Cushman------------------	C								
		All months	---	---	---	---	---	---	---
Cambria------------------	B								
		All months	---	---	---	---	---	---	---
122:									
Cushman------------------	C								
		All months	---	---	---	---	---	---	---
Cambria------------------	B								
		All months	---	---	---	---	---	---	---
123:									
Cushman------------------	C								
		All months	---	---	---	---	---	---	---
Renohill-----------------	C								
		All months	---	---	---	---	---	---	---
124:									
Cushman------------------	C								
		All months	---	---	---	---	---	---	---
Shingle------------------	D								
		All months	---	---	---	---	---	---	---

Water Features--Continued

Map symbol and soil name	Hydro-logic group	Month	Water Table: Upper limit	Water Table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
125:									
Cushman	C								
		All months	---	---	---	---	---	---	---
Terro	C								
		All months	---	---	---	---	---	---	---
126:									
Cushman	C								
		All months	---	---	---	---	---	---	---
Theedle	C								
		All months	---	---	---	---	---	---	---
127:									
Cushman	C								
		All months	---	---	---	---	---	---	---
Theedle	C								
		All months	---	---	---	---	---	---	---
128:									
Cushman	C								
		All months	---	---	---	---	---	---	---
Worf	D								
		All months	---	---	---	---	---	---	---
129:									
Decolney	B								
		All months	---	---	---	---	---	---	---
Hiland	B								
		All months	---	---	---	---	---	---	---
130:									
Decolney	B								
		All months	---	---	---	---	---	---	---
Hiland	B								
		All months	---	---	---	---	---	---	---
131:									
Deekay	B								
		All months	---	---	---	---	---	---	---
132:									
Deekay	B								
		All months	---	---	---	---	---	---	---
Moorhead	C								
		All months	---	---	---	---	---	---	---
133:									
Deekay	B								
		All months	---	---	---	---	---	---	---
Moorhead	C								
		All months	---	---	---	---	---	---	---

Water Features--Continued

Map symbol and soil name	Hydro-logic group	Month	Water Table: Upper limit	Water Table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
134:									
Deekay	B								
		All months	---	---	---	---	---	---	---
Oldwolf	C								
		All months	---	---	---	---	---	---	---
135:									
Deekay	B								
		All months	---	---	---	---	---	---	---
Oldwolf	C								
		All months	---	---	---	---	---	---	---
136:									
Deekay	B								
		All months	---	---	---	---	---	---	---
Ziggy	B								
		All months	---	---	---	---	---	---	---
137:									
Echeta	C								
		All months	---	---	---	---	---	---	---
138:									
Echeta	C								
		All months	---	---	---	---	---	---	---
Cromack	C								
		All months	---	---	---	---	---	---	---
139:									
Embry	B								
		All months	---	---	---	---	---	---	---
Orpha	A								
		All months	---	---	---	---	---	---	---
140:									
Embry	B								
		All months	---	---	---	---	---	---	---
Taluce	D								
		All months	---	---	---	---	---	---	---
141:									
Emigha	B								
		All months	---	---	---	---	---	---	---
142:									
Emigha, sodic	C								
		April	---	---	---	---	None	Very brief	Rare
		May	---	---	---	---	None	Very brief	Rare
		June	---	---	---	---	None	Very brief	Rare
		July	---	---	---	---	None	Very brief	Rare
Arvada, thick surface	D								
		All months	---	---	---	---	---	---	---

Water Features--Continued

Map symbol and soil name	Hydro-logic group	Month	Water Table: Upper limit	Water Table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
143:									
Felix, ponded	D								
		March	0.0	1.5-1.5	0.0-1.0	Long	Occasional	---	---
		April	0.0	1.5-1.5	0.0-1.0	Very long	Occasional	---	---
		May	0.0	1.5-1.5	0.0-1.0	Very long	Occasional	---	---
		June	0.0	1.5-1.5	0.0-1.0	Long	Occasional	---	---
144:									
Forkwood	B								
		All months	---	---	---	---	---	---	---
145:									
Forkwood	B								
		All months	---	---	---	---	---	---	---
Cambria	B								
		All months	---	---	---	---	---	---	---
146:									
Forkwood	B								
		All months	---	---	---	---	---	---	---
Cushman	C								
		All months	---	---	---	---	---	---	---
147:									
Forkwood	B								
		All months	---	---	---	---	---	---	---
Cushman	C								
		All months	---	---	---	---	---	---	---
148:									
Forkwood	B								
		All months	---	---	---	---	---	---	---
Ulm	D								
		All months	---	---	---	---	---	---	---
149:									
Forkwood	B								
		All months	---	---	---	---	---	---	---
Ulm	C								
		All months	---	---	---	---	---	---	---
150:									
Gateson	C								
		All months	---	---	---	---	---	---	---
Taluce	D								
		All months	---	---	---	---	---	---	---
Turnercrest	C								
		All months	---	---	---	---	---	---	---
151:									
Haverdad	B								
		April	---	---	---	---	None	Very brief	Occasional
		May	---	---	---	---	None	Very brief	Occasional
		June	---	---	---	---	None	Very brief	Occasional

Water Features--Continued

Map symbol and soil name	Hydro-logic group	Month	Water Table: Upper limit	Water Table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
152:									
Haverdad	B								
		April	---	---	---	---	None	Very brief	Occasional
		May	---	---	---	---	None	Very brief	Occasional
		June	---	---	---	---	None	Very brief	Occasional
		July	---	---	---	---	None	Very brief	Rare
Clarkelen	B								
		April	---	---	---	---	None	Very brief	Occasional
		May	---	---	---	---	None	Very brief	Occasional
		June	---	---	---	---	None	Very brief	Occasional
		July	---	---	---	---	None	Very brief	Rare
153:									
Haverdad	B								
		April	---	---	---	---	None	Very brief	Occasional
		May	---	---	---	---	None	Very brief	Occasional
		June	---	---	---	---	None	Very brief	Occasional
		July	---	---	---	---	None	Very brief	Rare
Kishona	B								
		All months	---	---	---	---	---	---	---
154:									
Heldt	C								
		All months	---	---	---	---	---	---	---
155:									
Heldt, saline	C								
		March	---	---	---	---	None	Long	Occasional
		April	---	---	---	---	None	Very long	Frequent
		May	---	---	---	---	None	Very long	Frequent
		June	---	---	---	---	None	Long	Occasional
		July	---	---	---	---	None	Brief	Rare
Bidman, saline	C								
		March	---	---	---	---	None	Long	Occasional
		April	---	---	---	---	None	Very long	Frequent
		May	---	---	---	---	None	Very long	Frequent
		June	---	---	---	---	None	Long	Occasional
		July	---	---	---	---	None	Brief	Rare
156:									
Hiland	B								
		All months	---	---	---	---	---	---	---
157:									
Hiland	B								
		All months	---	---	---	---	---	---	---
Bowbac	C								
		All months	---	---	---	---	---	---	---
158:									
Hiland	B								
		All months	---	---	---	---	---	---	---
Bowbac	C								
		All months	---	---	---	---	---	---	---

Water Features--Continued

Map symbol and soil name	Hydro-logic group	Month	Water Table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
159:									
Hiland--------------------	B								
		All months	---	---	---	---	---	---	---
Vonalee-------------------	B								
		All months	---	---	---	---	---	---	---
160:									
Hiland--------------------	B								
		All months	---	---	---	---	---	---	---
Vonalee-------------------	B								
		All months	---	---	---	---	---	---	---
161:									
Hilight-------------------	D								
		All months	---	---	---	---	---	---	---
Taluce, cool--------------	D								
		All months	---	---	---	---	---	---	---
Wags----------------------	D								
		All months	---	---	---	---	---	---	---
162:									
Lismas--------------------	D								
		All months	---	---	---	---	---	---	---
Mittenbutte, cool---------	D								
		All months	---	---	---	---	---	---	---
Sabatka-------------------	D								
		All months	---	---	---	---	---	---	---
163:									
Hilight-------------------	D								
		All months	---	---	---	---	---	---	---
Wags----------------------	D								
		All months	---	---	---	---	---	---	---
Badland-------------------	D								
		All months	---	---	---	---	---	---	---
164:									
Lismas--------------------	D								
		All months	---	---	---	---	---	---	---
Sabatka-------------------	D								
		All months	---	---	---	---	---	---	---
Badland-------------------	D								
		All months	---	---	---	---	---	---	---
165:									
Jayem---------------------	B								
		All months	---	---	---	---	---	---	---
166:									
Jaywest-------------------	C								
		All months	---	---	---	---	---	---	---

Water Features--Continued

Map symbol and soil name	Hydro-logic group	Month	Water Table: Upper limit	Water Table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
167:									
Jaywest	C	All months	---	---	---	---	---	---	---
Moorhead	C	All months	---	---	---	---	---	---	---
168:									
Jaywest	C	All months	---	---	---	---	---	---	---
Spottedhorse	C	All months	---	---	---	---	---	---	---
169:									
Julesburg	B	All months	---	---	---	---	---	---	---
170:									
Keeline	B	All months	---	---	---	---	---	---	---
Tullock	C	All months	---	---	---	---	---	---	---
171:									
Keeline	B	All months	---	---	---	---	---	---	---
Tullock	C	All months	---	---	---	---	---	---	---
Niobrara, dry	D	All months	---	---	---	---	---	---	---
172:									
Keyner	D	All months	---	---	---	---	---	---	---
173:									
Lawver	B	All months	---	---	---	---	---	---	---
Teckla	B	All months	---	---	---	---	---	---	---
Wibaux	B	All months	---	---	---	---	---	---	---
174:									
Brislawn	B	All months	---	---	---	---	---	---	---
Rockybutte	B	All months	---	---	---	---	---	---	---
Ironbutte	B	All months	---	---	---	---	---	---	---

Water Features--Continued

Map symbol and soil name	Hydro-logic group	Month	Water Table: Upper limit	Water Table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
175:									
Lawver	B								
		All months	---	---	---	---	---	---	---
Wibaux	B								
		All months	---	---	---	---	---	---	---
176:									
Leiter	C								
		All months	---	---	---	---	---	---	---
Cromack	C								
		All months	---	---	---	---	---	---	---
177:									
Maysdorf	B								
		All months	---	---	---	---	---	---	---
178:									
Maysdorf	B								
		All months	---	---	---	---	---	---	---
179:									
Maysdorf	B								
		All months	---	---	---	---	---	---	---
Pugsley	C								
		All months	---	---	---	---	---	---	---
180:									
Maysdorf	B								
		All months	---	---	---	---	---	---	---
Pugsley	C								
		All months	---	---	---	---	---	---	---
181:									
Moorhead	C								
		All months	---	---	---	---	---	---	---
182:									
Moorhead	C								
		All months	---	---	---	---	---	---	---
183:									
Moorhead	C								
		All months	---	---	---	---	---	---	---
Leiter	C								
		All months	---	---	---	---	---	---	---
184:									
Moorhead	C								
		All months	---	---	---	---	---	---	---
Leiter	C								
		All months	---	---	---	---	---	---	---
185:									
Moskee	B								
		All months	---	---	---	---	---	---	---

Water Features--Continued

Map symbol and soil name	Hydro-logic group	Month	Water Table: Upper limit	Water Table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
186:									
Moskee--------------------	B								
		All months	---	---	---	---	---	---	---
187:									
Nuncho--------------------	C								
		All months	---	---	---	---	---	---	---
188:									
Orpha---------------------	A								
		All months	---	---	---	---	---	---	---
Tullock-------------------	C								
		All months	---	---	---	---	---	---	---
189:									
Oshoto--------------------	C								
		All months	---	---	---	---	---	---	---
Moorhead------------------	C								
		All months	---	---	---	---	---	---	---
190:									
Parmleed------------------	C								
		All months	---	---	---	---	---	---	---
Renohill------------------	C								
		All months	---	---	---	---	---	---	---
192:									
Platmak-------------------	C								
		All months	---	---	---	---	---	---	---
193:									
Pugsley-------------------	C								
		All months	---	---	---	---	---	---	---
Decolney------------------	B								
		All months	---	---	---	---	---	---	---
194:									
Pugsley-------------------	C								
		All months	---	---	---	---	---	---	---
Decolney------------------	B								
		All months	---	---	---	---	---	---	---
195:									
Rauzi---------------------	B								
		All months	---	---	---	---	---	---	---
196:									
Rauzi---------------------	B								
		All months	---	---	---	---	---	---	---
197:									
Rauzi---------------------	B								
		All months	---	---	---	---	---	---	---
Elwop---------------------	C								
		All months	---	---	---	---	---	---	---

Water Features--Continued

Map symbol and soil name	Hydro-logic group	Month	Water Table: Upper limit	Water Table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
198:									
Recluse	B								
		All months	---	---	---	---	---	---	---
199:									
Renohill	C								
		All months	---	---	---	---	---	---	---
Savageton	C								
		All months	---	---	---	---	---	---	---
200:									
Renohill	C								
		All months	---	---	---	---	---	---	---
Savageton	C								
		All months	---	---	---	---	---	---	---
201:									
Renohill	C								
		All months	---	---	---	---	---	---	---
Shingle	D								
		All months	---	---	---	---	---	---	---
Worf	D								
		All months	---	---	---	---	---	---	---
202:									
Renohill	C								
		All months	---	---	---	---	---	---	---
Worfka	D								
		All months	---	---	---	---	---	---	---
203:									
Rockypoint	B								
		April	---	---	---	---	None	Very brief	Occasional
		May	---	---	---	---	None	Very brief	Occasional
		June	---	---	---	---	None	Very brief	Occasional
		July	---	---	---	---	None	Very brief	Rare
Iwait	B								
		All months	---	---	---	---	---	---	---
204:									
Samday	D								
		All months	---	---	---	---	---	---	---
Samday, cool	D								
		All months	---	---	---	---	---	---	---
Shingle	D								
		All months	---	---	---	---	---	---	---
205:									
Samday	D								
		All months	---	---	---	---	---	---	---
Savageton	C								
		All months	---	---	---	---	---	---	---

Water Features--Continued

Map symbol and soil name	Hydro-logic group	Month	Water Table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
206:									
Samday--------------------	D								
		All months	---	---	---	---	---	---	---
Shingle-------------------	D								
		All months	---	---	---	---	---	---	---
Badland-------------------	D								
		All months	---	---	---	---	---	---	---
207:									
Cromack-------------------	C								
		All months	---	---	---	---	---	---	---
Fairburn------------------	D								
		All months	---	---	---	---	---	---	---
Ucross--------------------	C								
		All months	---	---	---	---	---	---	---
208:									
Savageton-----------------	C								
		All months	---	---	---	---	---	---	---
Silhouette----------------	C								
		All months	---	---	---	---	---	---	---
209:									
Savageton-----------------	C								
		All months	---	---	---	---	---	---	---
Silhouette----------------	C								
		All months	---	---	---	---	---	---	---
210:									
Shingle-------------------	D								
		All months	---	---	---	---	---	---	---
Taluce--------------------	D								
		All months	---	---	---	---	---	---	---
211:									
Shingle-------------------	D								
		All months	---	---	---	---	---	---	---
Worf----------------------	D								
		All months	---	---	---	---	---	---	---
212:									
Teckla--------------------	B								
		All months	---	---	---	---	---	---	---
213:									
Terro---------------------	C								
		All months	---	---	---	---	---	---	---
Taluce--------------------	D								
		All months	---	---	---	---	---	---	---

Water Features--Continued

Map symbol and soil name	Hydro-logic group	Month	Water Table: Upper limit	Water Table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
214:									
Theedle	C								
		All months	---	---	---	---	---	---	---
Kishona	B								
		All months	---	---	---	---	---	---	---
215:									
Theedle	C								
		All months	---	---	---	---	---	---	---
Kishona	B								
		All months	---	---	---	---	---	---	---
216:									
Theedle	C								
		All months	---	---	---	---	---	---	---
Kishona	B								
		All months	---	---	---	---	---	---	---
Shingle	D								
		All months	---	---	---	---	---	---	---
217:									
Theedle	C								
		All months	---	---	---	---	---	---	---
Shingle	D								
		All months	---	---	---	---	---	---	---
218:									
Theedle	C								
		All months	---	---	---	---	---	---	---
Turnercrest	C								
		All months	---	---	---	---	---	---	---
Kishona	B								
		All months	---	---	---	---	---	---	---
219:									
Torriarents	C								
		All months	---	---	---	---	---	---	---
Torriorthents	C								
		All months	---	---	---	---	---	---	---
220:									
Pitchdraw	B								
		All months	---	---	---	---	---	---	---
Ashollow	B								
		All months	---	---	---	---	---	---	---
Niobrara	D								
		All months	---	---	---	---	---	---	---
221:									
Turnercrest	C								
		All months	---	---	---	---	---	---	---

Water Features--Continued

Map symbol and soil name	Hydro-logic group	Month	Water Table: Upper limit	Water Table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
221:(cont.)									
Keeline	B								
		All months	---	---	---	---	---	---	---
Taluce	D								
		All months	---	---	---	---	---	---	---
222:									
Turnercrest	C								
		All months	---	---	---	---	---	---	---
Wibaux, thin solum	B								
		All months	---	---	---	---	---	---	---
Taluce	D								
		All months	---	---	---	---	---	---	---
223:									
Ucross	C								
		All months	---	---	---	---	---	---	---
224:									
Ucross	C								
		All months	---	---	---	---	---	---	---
Iwait	B								
		All months	---	---	---	---	---	---	---
225:									
Ucross	C								
		All months	---	---	---	---	---	---	---
Iwait	B								
		All months	---	---	---	---	---	---	---
Fairburn	D								
		All months	---	---	---	---	---	---	---
226:									
Ulm	C								
		All months	---	---	---	---	---	---	---
227:									
Ulm	C								
		All months	---	---	---	---	---	---	---
228:									
Ulm	C								
		All months	---	---	---	---	---	---	---
Renohill	C								
		All months	---	---	---	---	---	---	---
229:									
Ulm	C								
		All months	---	---	---	---	---	---	---
Renohill	C								
		All months	---	---	---	---	---	---	---

Water Features--Continued

Map symbol and soil name	Hydro-logic group	Month	Water Table: Upper limit	Water Table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
230:									
Deekay	B	All months	---	---	---	---	---	---	---
Moorhead	C	All months	---	---	---	---	---	---	---
231:									
Leiter	C	All months	---	---	---	---	---	---	---
Moorhead	C	All months	---	---	---	---	---	---	---
232:									
Pitchdraw	B	All months	---	---	---	---	---	---	---
Ashollow	B	All months	---	---	---	---	---	---	---
233:									
Ustic Torriorthents	C	All months	---	---	---	---	---	---	---
234:									
Ustic Torriorthents	C	All months	---	---	---	---	---	---	---
Badland	D	All months	---	---	---	---	---	---	---
235:									
Vonalee	B	All months	---	---	---	---	---	---	---
236:									
Vonalee	B	All months	---	---	---	---	---	---	---
Terro	C	All months	---	---	---	---	---	---	---
237:									
Vonalf	B	All months	---	---	---	---	---	---	---
238:									
Vonalf	B	All months	---	---	---	---	---	---	---
Xema	C	All months	---	---	---	---	---	---	---
239:									
Ironbutte	B	All months	---	---	---	---	---	---	---
Fairburn	D	All months	---	---	---	---	---	---	---

Water Features--Continued

Map symbol and soil name	Hydro-logic group	Month	Water Table: Upper limit	Water Table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
239:(cont.)									
Mittenbutte----------------	D								
		All months	---	---	---	---	---	---	---
240:									
Wibaux--------------------	B								
		All months	---	---	---	---	---	---	---
Wibaux, thin solum--------	B								
		All months	---	---	---	---	---	---	---
241:									
Ironbutte-----------------	B								
		All months	---	---	---	---	---	---	---
Ironbutte, thin solum-----	B								
		All months	---	---	---	---	---	---	---
242:									
Ironbutte-----------------	B								
		All months	---	---	---	---	---	---	---
Deekay--------------------	B								
		All months	---	---	---	---	---	---	---
Moorhead------------------	C								
		All months	---	---	---	---	---	---	---
243:									
Wibaux, thick solum-------	B								
		All months	---	---	---	---	---	---	---
Wibaux--------------------	B								
		All months	---	---	---	---	---	---	---
244:									
Muleherder----------------	B								
		All months	---	---	---	---	---	---	---
Ironbutte-----------------	B								
		All months	---	---	---	---	---	---	---
245:									
Wibaux--------------------	B								
		All months	---	---	---	---	---	---	---
Shingle-------------------	D								
		All months	---	---	---	---	---	---	---
246:									
Wyarno--------------------	C								
		All months	---	---	---	---	---	---	---
Ulm-----------------------	C								
		All months	---	---	---	---	---	---	---
247:									
Wyotite-------------------	B								
		All months	---	---	---	---	---	---	---

Water Features--Continued

Map symbol and soil name	Hydro-logic group	Month	Water Table: Upper limit	Water Table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
247: (cont.)									
Ulm----------------------	C								
		All months	---	---	---	---	---	---	---
248:									
Ziggy--------------------	B								
		All months	---	---	---	---	---	---	---
Iwait--------------------	B								
		All months	---	---	---	---	---	---	---
249:									
Ziggy--------------------	B								
		All months	---	---	---	---	---	---	---
Iwait--------------------	B								
		All months	---	---	---	---	---	---	---
250:									
Ziggy--------------------	B								
		All months	---	---	---	---	---	---	---
Ucross-------------------	C								
		All months	---	---	---	---	---	---	---
Oldwolf------------------	C								
		All months	---	---	---	---	---	---	---

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Glossary

ABC soil. A soil having an A, a B, and a C horizon.

AC soil. A soil having only an A and a C horizon. Commonly, such soil formed in recent alluvium or on steep, rocky slopes.

Aeration, soil. The exchange of air in soil with air from the atmosphere. The air in a well aerated soil is similar to that in the atmosphere; the air in a poorly aerated soil is considerably higher in carbon dioxide and lower in oxygen.

Aggregate, soil. Many fine particles held in a single mass or cluster. Natural soil aggregates, such as granules, blocks, or prisms, are called peds. Clods are aggregates produced by tillage or logging.

Alkali (sodic) soil. A soil having so high a degree of alkalinity (pH 8.5 or higher) or so high a percentage of exchangeable sodium (15 percent or more of the total exchangeable bases), or both, that plant growth is restricted.

Alluvial fan. The fanlike deposit of a stream where it issues from a gorge upon a plain or of a tributary stream near or at its junction with its main stream.

Alluvium. Material, such as sand, silt, or clay, deposited on land by streams.

Alpha,alpha-dipyridyl. A dye that when dissolved in 1N ammonium acetate is used to detect the presence of reduced iron (Fe II) in the soil. A positive reaction indicates a type of redoximorphic feature.

Animal unit month (AUM). The amount of forage required by one mature cow of approximately 1,000 pounds weight, with or without a calf, for 1 month.

Aquic conditions. Current soil wetness characterized by saturation, reduction, and redoximorphic features.

Area reclaim (in tables). An area difficult to reclaim after the removal of soil for construction and other uses. Revegetation and erosion control are extremely difficult.

Argillic horizon. A genetically developed horizon of significant clay accumulation, situated below the surface layer in a soil profile. It is that part of the subsoil referred to as the Bt and, in some profiles, the Btk horizon.

Aspect. The direction in which a slope faces.

Association, soil. A group of soils or miscellaneous areas geographically associated in a characteristic repeating pattern and defined and delineated as a single map unit.

Authigenic. The accumulation of salts in a soil horizon which are derived primarily from the parent material and which formed in place.

Available water capacity (available moisture capacity). The capacity of soils to hold water available for use by most plants. It is commonly defined as the difference between the amount of soil water at field moisture capacity and the amount at wilting point. It is commonly expressed as inches of water per inch of soil. The capacity, in inches, in a 60-inch profile or to a limiting layer is expressed as:

Very low	0 to 3.5
Low	3.5 to 5.0
Moderate	5.0 to 7.5
High	more than 7.5

Backslope. The position that forms the steepest and generally linear, middle portion of a hillslope. In profile, backslopes are commonly bounded by a convex shoulder above and a concave footslope below.

Badland. Steep or very steep, commonly nonstony, barren land dissected by many intermittent drainage channels. Badland is most common in semiarid and arid regions where streams are entrenched in soft geologic material. Local relief generally ranges from 25 to 500 feet. Runoff potential is very high, and geologic erosion is active.

Base saturation. The degree to which material having cation-exchange properties is saturated with exchangeable bases (sum of Ca, Mg, Na, and K), expressed as a percentage of the total cation-exchange capacity.

Base slope. A geomorphic component of hills consisting of the concave to linear (perpendicular to the contour) slope that, regardless of the lateral shape, forms an apron or wedge at the bottom of a hillside dominated by colluvium and slope-wash sediments (for example, slope alluvium).

Bedding planes. Fine strata, less than 5 millimeters thick, in unconsolidated alluvial, eolian, lacustrine, or marine sediment.

Bedding system. A drainage system made by plowing, grading, or otherwise shaping the surface of a flat field. It consists of a series of low ridges separated by shallow, parallel dead furrows.

Bedrock. The solid rock that underlies the soil and other unconsolidated material or that is exposed at the surface.

Bedrock-controlled topography. A landscape where the configuration and relief of the landforms are determined or strongly influenced by the underlying bedrock.

Bisequum. Two sequences of soil horizons, each of which consists of an illuvial horizon and the overlying eluvial horizons.

Blowout. A shallow depression from which all or most of the soil material has been removed by the wind. A blowout has a flat or irregular floor formed by a resistant layer or by an accumulation of pebbles or cobbles. In some blowouts the water table is exposed.

Bottom land. The normal flood plain of a stream, subject to flooding.

Breaks. The steep and very steep broken land at the border of an upland summit that is dissected by ravines.

Brush management. Use of mechanical, chemical, or biological methods to make conditions favorable for reseeding or to reduce or eliminate competition from woody vegetation and thus allow understory grasses and forbs to recover. Brush management increases forage production and thus reduces the hazard of erosion. It can improve the habitat for some species of wildlife.

Butte. An isolated small mountain or hill with steep or precipitous sides and a top variously flat, rounded, or pointed that may be a residual mass isolated by erosion or an exposed volcanic neck.

Calcareous soil. A soil containing enough calcium carbonate (commonly combined with magnesium carbonate) to effervesce visibly when treated with cold, dilute hydrochloric acid.

Cambic horizon. A structural horizon below the surface layer which does not have the clay accumulation necessary for an argillic horizon. It is that part of the subsoil referred to as the Bw horizon.

Canopy. The leafy crown of trees or shrubs. (See Crown.)

Capillary water. Water held as a film around soil particles and in tiny spaces between particles. Surface tension is the adhesive force that holds capillary water in the soil.

Cation. An ion carrying a positive charge of electricity. The common soil cations are calcium, potassium, magnesium, sodium, and hydrogen.

Cation-exchange capacity. The total amount of exchangeable cations that can be held by the soil, expressed in terms of milliequivalents per 100 grams of soil at neutrality (pH 7.0) or at some other stated pH value. The term, as applied to soils, is synonymous with base-exchange capacity but is more precise in meaning.

Channery soil material. Soil material that has, by volume, 15 to 35 percent thin, flat fragments of sandstone, shale, slate, limestone, or schist as much as 6 inches (15 centimeters) along the longest axis. A single piece is called a channer.

Chemical treatment. Control of unwanted vegetation through the use of chemicals.

Chiseling. Tillage with an implement having one or more soil-penetrating points that shatter or loosen hard, compacted layers to a depth below normal plow depth.

Clay. As a soil separate, the mineral soil particles less than 0.002 millimeter in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

Clay depletions. Low-chroma zones having a low content of iron, manganese, and clay because of the chemical reduction of iron and manganese and the removal of iron, manganese, and clay. A type of redoximorphic depletion.

Clay film. A thin coating of oriented clay on the surface of a soil aggregate or lining pores or root channels. Synonyms: clay coating, clay skin.

Claypan. A slowly permeable soil horizon that contains much more clay than the horizons above it. A claypan is commonly hard when dry and plastic or stiff when wet.

Climax plant community. The stabilized plant community on a particular site. The plant cover reproduces itself and does not change so long as the environment remains the same.

Coarse textured soil. Sand or loamy sand.

Cobble (or cobblestone). A rounded or partly rounded fragment of rock 3 to 10 inches (7.6 to 25 centimeters) in diameter.

Colluvium. Soil material or rock fragments, or both, moved by creep, slide, or local wash and deposited at the base of steep slopes.

Complex slope. Irregular or variable slope. Planning or establishing terraces, diversions, and other water-control structures on a complex slope is difficult.

Complex, soil. A map unit of two or more kinds of soil or miscellaneous areas in such an intricate pattern or so small in area that it is not practical to map them separately at the selected scale of mapping. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas.

Compressible (in tables). Excessive decrease in volume of soft soil under load.

Concretions. Cemented bodies with crude internal symmetry organized around a point, a line, or a plane. They typically take the form of concentric layers visible to the naked eye. Calcium carbonate, iron oxide, and manganese oxide are common compounds making up concretions. If formed in place, concretions of iron oxide or manganese oxide are generally considered a type of redoximorphic concentration.

Conservation cropping system. Growing crops in combination with needed cultural and management practices. In a good conservation cropping system, the soil-improving crops and practices more than offset the effects of the soil-depleting crops and practices. Cropping systems are needed on all tilled soils. Soil-improving practices in a conservation cropping system include the use of rotations that contain grasses and legumes and the return of crop residue to the soil. Other practices include the use of green manure crops of grasses and legumes, proper tillage, adequate fertilization, and weed and pest control.

Conservation tillage. A tillage system that does not invert the soil and that leaves a protective amount of crop residue on the surface throughout the year.

Consistence, soil. Refers to the degree of cohesion and adhesion of soil material and its resistance to deformation when ruptured. Consistence includes resistance of soil material to rupture and to penetration; plasticity, toughness, and stickiness of puddled soil material; and the manner in which the soil material behaves when subject to compression. Terms describing consistence are defined in the "Soil Survey Manual."

Contour stripcropping. Growing crops in strips that follow the contour. Strips of grass or close-growing crops are alternated with strips of clean-tilled crops or summer fallow.

Control section. The part of the soil on which classification is based. The thickness varies among different kinds of soil, but for many it is that part of the soil profile between depths of 10 inches and 40 inches.

Corrosion. Soil-induced electrochemical or chemical action that dissolves or weakens concrete or uncoated steel.

Cover crop. A close-growing crop grown primarily to improve and protect the soil between periods of regular crop production, or a crop grown between trees and vines in orchards and vineyards.

Cretaceous age. The period of the Cenozoic Era of geologic time from approximately 100 million to 65 million years ago.

Cropping system. Growing crops according to a planned system of rotation and management practices.

Crop residue management. Returning crop residue to the soil, which helps to maintain soil structure, organic matter content, and fertility and helps to control erosion.

Crown. The upper part of a tree or shrub, including the living branches and their foliage.

Cutbanks cave (in tables). The walls of excavations tend to cave in or slough.

Decreasers. The most heavily grazed climax range plants. Because they are the most palatable, they are the first to be destroyed by overgrazing.

Deferred grazing. Postponing grazing or resting grazing land for a prescribed period.

Dense layer (in tables). A very firm, massive layer that has a bulk density of more than 1.8 grams per cubic centimeter. Such a layer affects the ease of digging and can affect filling and compacting.

Depth, soil. Generally, the thickness of the soil over bedrock. Very deep soils are more than 60 inches deep over bedrock; deep soils, 40 to 60 inches; moderately deep, 20 to 40 inches; shallow, 10 to 20 inches; and very shallow, less than 10 inches.

Depth to rock (in tables). Bedrock is too near the surface for the specified use.

Diversion (or diversion terrace). A ridge of earth, generally a terrace, built to protect downslope areas by diverting runoff from its natural course.

Drainage class (natural). Refers to the frequency and duration of wet periods under conditions similar to those under which the soil formed. Alterations of the water regime by human activities, either through drainage or irrigation, are not a consideration unless they have significantly changed the morphology of the soil. Seven classes of natural soil drainage are recognized—*excessively drained, somewhat excessively drained, well drained, moderately well drained, somewhat poorly drained, poorly drained,* and *very poorly drained.* These classes are defined in the "Soil Survey Manual."

Drainage, surface. Runoff, or surface flow of water, from an area.

Draw. A small stream valley that generally is more open and has broader bottom land than a ravine or gulch.

Duff. A generally firm organic layer on the surface of mineral soils. It consists of fallen plant material that is in the process of decomposition and includes everything from the litter on the surface to underlying pure humus.

Dune. A mound, ridge, or hill of loose, windblown granular material (generally sand), either bare or covered with vegetation.

Eluviation. The movement of material in true solution or colloidal suspension from one place to another within the soil. Soil horizons that have lost material through eluviation are eluvial; those that have received material are illuvial.

Endosaturation. A type of saturation of the soil in which all horizons between the upper boundary of saturation and a depth of 2 meters are saturated.

Eolian soil material. Earthy parent material accumulated through wind action; commonly refers to sandy material in dunes or to loess in blankets on the surface.

Ephemeral stream. A stream, or reach of a stream, that flows only in direct response to precipitation. It receives no long-continued supply from melting snow or other source, and its channel is above the water table at all times.

Episaturation. A type of saturation indicating a perched water table in a soil in which saturated layers are underlain by one or more unsaturated layers within 2 meters of the surface.

Erosion. The wearing away of the land surface by water, wind, ice, or other geologic agents and by such processes as gravitational creep.

Erosion (geologic). Erosion caused by geologic processes acting over long geologic periods and resulting in the wearing away of mountains and the building up of such landscape features as flood plains and coastal plains. Synonym: natural erosion.

Erosion (accelerated). Erosion much more rapid than geologic erosion, mainly as a result of human or animal activities or of a catastrophe in nature, such as a fire, that exposes the surface.

Escarpment. A relatively continuous and steep slope or cliff breaking the general continuity of more gently sloping land surfaces and resulting from erosion or faulting. Synonym: scarp.

Excess fines (in tables). Excess silt and clay in the soil. The soil does not provide a source of gravel or sand for construction purposes.

Excess lime (in tables). Excess carbonates in the soil that restrict the growth of some plants.

Excess salts (in tables). Excess water-soluble salts in the soil that restrict the growth of most plants.

Excess sodium (in tables). Excess exchangeable sodium in the soil. The resulting poor physical properties restrict the growth of plants.

Fallow. Cropland left idle in order to restore productivity through accumulation of moisture. Summer fallow is common in regions of limited rainfall where cereal grain is grown. The soil is tilled for at least one growing season for weed control and decomposition of plant residue.

Fan remnant. A relict alluvial fan, no longer a site of active deposition, incised by younger and lower alluvial surfaces.

Fast intake (in tables). The rapid movement of water into the soil.

Fertility, soil. The quality that enables a soil to provide plant nutrients, in adequate amounts and in proper balance, for the growth of specified plants when light, moisture, temperature, tilth, and other growth factors are favorable.

Field moisture capacity. The moisture content of a soil, expressed as a percentage of the ovendry weight, after the gravitational, or free, water has drained away; the field moisture content 2 or 3 days after a soaking rain; also called *normal field*

capacity, normal moisture capacity, or *capillary capacity.*

Fill slope. A sloping surface consisting of excavated soil material from a road cut. It commonly is on the downhill side of the road.

Fine textured soil. Sandy clay, silty clay, or clay.

Flagstone. A thin fragment of sandstone, slate or shale 6 to 15 inches (15 to 38 centimeters) long.

Flood plain. A nearly level alluvial plain that borders a stream and is subject to flooding unless protected artificially.

Footslope. The position that forms the inner, gently inclined surface at the base of a hillslope. In profile, footslopes are commonly concave. A footslope is a transition zone between upslope sites of erosion and transport (shoulders and backslopes) and downslope sites of deposition (toeslopes).

Forb. Any herbaceous plant not a grass or a sedge.

Fragile (in tables). A soil that is easily damaged by use or disturbance.

Frost action (in tables). Freezing and thawing of soil moisture. Frost action can damage roads, buildings and other structures, and plant roots.

Genesis, soil. The mode of origin of the soil. Refers especially to the processes or soil-forming factors responsible for the formation of the solum, or true soil, from the unconsolidated parent material.

Gleyed soil. Soil that formed under poor drainage, resulting in the reduction of iron and other elements in the profile and in gray colors.

Grassed waterway. A natural or constructed waterway, typically broad and shallow, seeded to grass as protection against erosion. Conducts surface water away from cropland.

Gravel. Rounded or angular fragments of rock as much as 3 inches (2 millimeters to 7.6 centimeters) in diameter. An individual piece is a pebble.

Gravelly soil material. Material that has 15 to 35 percent, by volume, rounded or angular rock fragments, not prominently flattened, as much as 3 inches (7.6 centimeters) in diameter.

Green manure crop (agronomy). A soil-improving crop grown to be plowed under in an early stage of maturity or soon after maturity.

Ground water. Water filling all the unblocked pores of the material below the water table.

Gully. A miniature valley with steep sides cut by running water and through which water ordinarily runs only after rainfall. The distinction between a gully and a rill is one of depth. A gully generally is an obstacle to farm machinery and is too deep to be obliterated by ordinary tillage; a rill is of lesser depth and can be smoothed over by ordinary tillage.

Hard bedrock. Bedrock that cannot be excavated except by blasting or by the use of special equipment that is not commonly used in construction.

Head slope. A geomorphic component of hills consisting of a laterally concave area of a hillside, especially at the head of a drainageway. The overland waterflow is converging.

High-residue crops. Such crops as small grain and corn used for grain. If properly managed, residue from these crops can be used to control erosion until the next crop in the rotation is established. These crops return large amounts of organic matter to the soil.

Hill. A natural elevation of the land surface, rising as much as 1,000 feet above surrounding lowlands, commonly of limited summit area and having a well defined outline; hillsides generally have slopes of more than 15 percent. The distinction between a hill and a mountain is arbitrary and is dependent on local usage.

Horizon, soil. A layer of soil, approximately parallel to the surface, having distinct characteristics produced by soil-forming processes. In the identification of soil horizons, an uppercase letter represents the major horizons. Numbers or lowercase letters that follow represent subdivisions of the major horizons. An explanation of the subdivisions is given in the "Soil Survey Manual." The major horizons of mineral soil are as follows:

O horizon.—An organic layer of fresh and decaying plant residue.

A horizon.—The mineral horizon at or near the surface in which an accumulation of humified organic matter is mixed with the mineral material. Also, a plowed surface horizon, most of which was originally part of a B horizon.

E horizon.—The mineral horizon in which the main feature is loss of silicate clay, iron, aluminum, or some combination of these.

B horizon.—The mineral horizon below an A horizon. The B horizon is in part a layer of transition from the overlying A to the underlying C horizon. The B horizon also has distinctive

characteristics, such as (1) accumulation of clay, sesquioxides, humus, or a combination of these; (2) prismatic or blocky structure; (3) redder or browner colors than those in the A horizon; or (4) a combination of these.

C horizon.—The mineral horizon or layer, excluding indurated bedrock, that is little affected by soil-forming processes and does not have the properties typical of the overlying soil material. The material of a C horizon may be either like or unlike that in which the solum formed. If the material is known to differ from that in the solum, an Arabic numeral, commonly a 2, precedes the letter C.

Cr horizon.—Soft, consolidated bedrock beneath the soil.

R layer.—Consolidated bedrock beneath the soil. The bedrock commonly underlies a C horizon, but it can be directly below an A or a B horizon.

Humus. The well decomposed, more or less stable part of the organic matter in mineral soils.

Hydrologic soil groups. Refers to soils grouped according to their runoff potential. The soil properties that influence this potential are those that affect the minimum rate of water infiltration on a bare soil during periods after prolonged wetting when the soil is not frozen. These properties are depth to a seasonal high water table, the infiltration rate and permeability after prolonged wetting, and depth to a very slowly permeable layer. The slope and the kind of plant cover are not considered but are separate factors in predicting runoff.

Illuviation. The movement of soil material from one horizon to another in the soil profile. Generally, material is removed from an upper horizon and deposited in a lower horizon.

Impervious soil. A soil through which water, air, or roots penetrate slowly or not at all. No soil is absolutely impervious to air and water all the time.

Increasers. Species in the climax vegetation that increase in amount as the more desirable plants are reduced by close grazing. Increasers commonly are the shorter plants and the less palatable to livestock.

Infiltration. The downward entry of water into the immediate surface of soil or other material, as contrasted with percolation, which is movement of water through soil layers or material.

Infiltration capacity. The maximum rate at which water can infiltrate into a soil under a given set of conditions.

Infiltration rate. The rate at which water penetrates the surface of the soil at any given instant, usually expressed in inches per hour. The rate can be limited by the infiltration capacity of the soil or the rate at which water is applied at the surface.

Interfluve. An elevated area between two drainageways that sheds water to those drainageways.

Intermittent stream. A stream, or reach of a stream, that flows for prolonged periods only when it receives ground-water discharge or long, continued contributions from melting snow or other surface and shallow subsurface sources.

Invaders. On range, plants that encroach into an area and grow after the climax vegetation has been reduced by grazing. Generally, plants invade following disturbance of the surface.

Iron depletions. Low-chroma zones having a low content of iron and manganese oxide because of chemical reduction and removal, but having a clay content similar to that of the adjacent matrix. A type of redoximorphic depletion.

Knoll. A small, low, rounded hill rising above adjacent landforms.

Lamellae. Bands or layers containing translocated clay, which occur at irregular intervals in a soil profile. Coarser material typically occurs between bands. Lamellae constitute an argillic horizon when their cumulative thickness exceeds six inches.

Large stones (in tables). Rock fragments 3 inches (7.6 centimeters) or more across. Large stones adversely affect the specified use of the soil.

Leaching. The removal of soluble material from soil or other material by percolating water.

Lignite. Soft, dark brown to black coal which occurs as a powdery material or as fine flakes in some soils and parent materials.

Liquid limit. The moisture content at which the soil passes from a plastic to a liquid state.

Loam. Soil material that is 7 to 27 percent clay particles, 28 to 50 percent silt particles, and less than 52 percent sand particles.

Loess. Fine grained material, dominantly of silt-sized particles, deposited by wind.

Low strength. The soil is not strong enough to support loads.

Masses. Concentrations of substances in the soil matrix that do not have a clearly defined boundary with the surrounding soil material and cannot be removed as a discrete unit. Common compounds making up masses are calcium

carbonate, gypsum or other soluble salts, iron oxide, and manganese oxide. Masses consisting of iron oxide or manganese oxide generally are considered a type of redoximorphic concentration.

Mechanical treatment. Use of mechanical equipment for seeding, brush management, and other management practices.

Medium textured soil. Very fine sandy loam, loam, silt loam, or silt.

Mesa. A broad, nearly flat topped and commonly isolated upland mass characterized by summit widths that are more than the heights of bounding erosional scarps.

Mineral soil. Soil that is mainly mineral material and low in organic material. Its bulk density is more than that of organic soil.

Minimum tillage. Only the tillage essential to crop production and prevention of soil damage.

Miscellaneous area. An area that has little or no natural soil and supports little or no vegetation.

Moderately coarse textured soil. Coarse sandy loam, sandy loam, or fine sandy loam.

Moderately fine textured soil. Clay loam, sandy clay loam, or silty clay loam.

Mollic epipedon. A thick, dark, humus-rich surface horizon (or horizons) that has high base saturation and pedogenic soil structure. It may include the upper part of the subsoil.

Morphology, soil. The physical makeup of the soil, including the texture, structure, porosity, consistence, color, and other physical, mineral, and biological properties of the various horizons, and the thickness and arrangement of those horizons in the soil profile.

Mottling, soil. Irregular spots of different colors that vary in number and size. Descriptive terms are as follows: abundance—*few, common,* and *many;* size—*fine, medium,* and *coarse;* and contrast—*faint, distinct,* and *prominent.* The size measurements are of the diameter along the greatest dimension. *Fine* indicates less than 5 millimeters (about 0.2 inch); *medium,* from 5 to 15 millimeters (about 0.2 to 0.6 inch); and *coarse,* more than 15 millimeters (about 0.6 inch).

Munsell notation. A designation of color by degrees of three simple variables—hue, value, and chroma. For example, a notation of 10YR 6/4 is a color with hue of 10YR, value of 6, and chroma of 4.

Natric horizon. A special kind of argillic horizon that contains enough exchangeable sodium to have an adverse effect on the physical condition of the subsoil.

Neutral soil. A soil having a pH value of 6.6 to 7.3. (See Reaction, soil.)

Nodules. Cemented bodies lacking visible internal structure. Calcium carbonate, iron oxide, and manganese oxide are common compounds making up nodules. If formed in place, nodules of iron oxide or manganese oxide are considered types of redoximorphic concentrations.

Nose slope. A geomorphic component of hills consisting of the projecting end (laterally convex area) of a hillside. The overland waterflow is predominantly divergent.

Nutrient, plant. Any element taken in by a plant essential to its growth. Plant nutrients are mainly nitrogen, phosphorus, potassium, calcium, magnesium, sulfur, iron, manganese, copper, boron, and zinc obtained from the soil and carbon, hydrogen, and oxygen obtained from the air and water.

Organic matter. Plant and animal residue in the soil in various stages of decomposition. The content of organic matter in the surface layer is described as follows:

Very low	less than 0.5 percent
Low	0.5 to 1.0 percent
Moderately low	1.0 to 2.0 percent
Moderate	2.0 to 4.0 percent
High	4.0 to 8.0 percent
Very high	more than 8.0 percent

Pan. A compact, dense layer in a soil that impedes the movement of water and the growth of roots. For example, *hardpan, fragipan, claypan, plowpan,* and *traffic pan.*

Parent material. The unconsolidated organic and mineral material in which soil forms.

Ped. An individual natural soil aggregate, such as a granule, a prism, or a block.

Pedisediment. A thin layer of alluvial material that mantles an erosion surface and has been transported to its present position from higher lying areas of the erosion surface.

Pedon. The smallest volume that can be called "a soil." A pedon is three dimensional and large enough to permit study of all horizons. Its area ranges from about 10 to 100 square feet (1 square meter to 10 square meters), depending on the variability of the soil.

Percolation. The movement of water through the soil.

Percs slowly (in tables). The slow movement of

water through the soil adversely affects the specified use.

Permeability. The quality of the soil that enables water or air to move downward through the profile. The rate at which a saturated soil transmits water is accepted as a measure of this quality. In soil physics, the rate is referred to as "saturated hydraulic conductivity," which is defined in the "Soil Survey Manual." In line with conventional usage in the engineering profession and with traditional usage in published soil surveys, this rate of flow continues to be expressed as "permeability." Terms describing permeability, measured in inches per hour, are as follows:

Extremely slow	0.0 to 0.01 inch
Very slow	0.01 to 0.06 inch
Slow	0.06 to 0.2 inch
Moderately slow	0.2 to 0.6 inch
Moderate	0.6 inch to 2.0 inches
Moderately rapid	2.0 to 6.0 inches
Rapid	6.0 to 20 inches
Very rapid	more than 20 inches

Phase, soil. A subdivision of a soil series based on features that affect its use and management, such as slope, stoniness, and flooding.

pH value. A numerical designation of acidity and alkalinity in soil. (See Reaction, soil.)

Piping (in tables). Formation of subsurface tunnels or pipelike cavities by water moving through the soil.

Plasticity index. The numerical difference between the liquid limit and the plastic limit; the range of moisture content within which the soil remains plastic.

Plastic limit. The moisture content at which a soil changes from semisolid to plastic.

Playa. The generally dry and nearly level lake plain that occupies the lowest parts of closed depressional areas, such as those on intermontane basin floors. Temporary or seasonal ponding occurs primarily in response to precipitation and runoff.

Plowpan. A compacted layer formed in the soil directly below the plowed layer.

Ponding. Standing water on soils in closed depressions. Unless the soils are artificially drained, the water can be removed only by percolation or evapotranspiration.

Poor filter (in tables). Because of rapid or very rapid permeability, the soil may not adequately filter effluent from a waste disposal system.

Poorly graded. Refers to a coarse grained soil or soil material consisting mainly of particles of nearly the same size. Because there is little difference in size of the particles, density can be increased only slightly by compaction.

Poor outlets (in tables). Refers to areas where surface or subsurface drainage outlets are difficult or expensive to install.

Porcelanite. A hard rock-like material of relatively low specific gravity, formed by the baking and fusing of shale and sandstone adjacent to (commonly overlying) burned-out coal seams. A material which is more resistant to weathering than surrounding Tertiary formations, porcelanite typically forms rounded, rolling to steep hills and conical peaks that occur throughout the eastern half of the survey area. It is resistant to erosion.

Potential native plant community. See Climax plant community.

Potential rooting depth (effective rooting depth). Depth to which roots could penetrate if the content of moisture in the soil were adequate. The soil has no properties restricting the penetration of roots to this depth.

Prescribed burning. Deliberately burning an area for specific management purposes, under the appropriate conditions of weather and soil moisture and at the proper time of day.

Productivity, soil. The capability of a soil for producing a specified plant or sequence of plants under specific management.

Profile, soil. A vertical section of the soil extending through all its horizons and into the parent material.

Proper grazing use. Grazing at an intensity that maintains enough cover to protect the soil and maintain or improve the quantity and quality of the desirable vegetation. This practice increases the vigor and reproduction capacity of the key plants and promotes the accumulation of litter and mulch necessary to conserve soil and water.

Range condition. The present composition of the plant community on a range site in relation to the potential natural plant community for that site. Range condition is expressed as excellent, good, fair, or poor on the basis of how much the present plant community has departed from the potential.

Rangeland. Land on which the potential natural vegetation is predominantly grasses, grasslike plants, forbs, or shrubs suitable for grazing or browsing. It includes natural grasslands, savannas, many wetlands, some deserts,

tundras, and areas that support certain forb and shrub communities.

Range site. An area of rangeland where climate, soil, and relief are sufficiently uniform to produce a distinct natural plant community. A range site is the product of all the environmental factors responsible for its development. It is typified by an association of species that differ from those on other range sites in kind or proportion of species or total production.

Reaction, soil. A measure of acidity or alkalinity of a soil, expressed in pH values. A soil that tests to pH 7.0 is described as precisely neutral in reaction because it is neither acid nor alkaline. The degrees of acidity or alkalinity, expressed as pH values, are:

Ultra acid	less than 3.5
Extremely acid	3.5 to 4.4
Very strongly acid	4.5 to 5.0
Strongly acid	5.1 to 5.5
Moderately acid	5.6 to 6.0
Slightly acid	6.1 to 6.5
Neutral	6.6 to 7.3
Slightly alkaline	7.4 to 7.8
Moderately alkaline	7.9 to 8.4
Strongly alkaline	8.5 to 9.0
Very strongly alkaline	9.1 and higher

Redoximorphic concentrations. Nodules, concretions, soft masses, pore linings, and other features resulting from the accumulation of iron or manganese oxide. An indication of chemical reduction and oxidation resulting from saturation.

Redoximorphic depletions. Low-chroma zones from which iron and manganese oxide or a combination of iron and manganese oxide and clay has been removed. These zones are indications of the chemical reduction of iron resulting from saturation.

Redoximorphic features. Redoximorphic concentrations, redoximorphic depletions, reduced matrices, a positive reaction to alpha, alpha-dipyridyl, and other features indicating the chemical reduction and oxidation of iron and manganese compounds resulting from saturation.

Reduced matrix. A soil matrix that has low chroma in situ because of chemically reduced iron (Fe II). The chemical reduction results from nearly continuous wetness. The matrix undergoes a change in hue or chroma within 30 minutes after exposure to air as the iron is oxidized (Fe III). A type of redoximorphic feature.

Relief. The elevations or inequalities of a land surface, considered collectively.

Residuum (residual soil material). Unconsolidated, weathered or partly weathered mineral material that accumulated as consolidated rock disintegrated in place.

Ridge. A long, narrow elevation of land surface, usually sharp crested with steep sides and forming an extended upland between valleys.

Rill. A steep-sided channel resulting from accelerated erosion. A rill generally is a few inches deep and not wide enough to be an obstacle to farm machinery.

Road cut. A sloping surface produced by mechanical means during road construction. It is commonly on the uphill side of the road.

Rock fragments. Rock or mineral fragments having a diameter of 2 millimeters or more; for example, pebbles, cobbles, stones, and boulders.

Rooting depth (in tables). Shallow root zone. The soil is shallow over a layer that greatly restricts roots.

Root zone. The part of the soil that can be penetrated by plant roots.

Runoff. The precipitation discharged into stream channels from an area. The water that flows off the surface of the land without sinking into the soil is called surface runoff. Water that enters the soil before reaching surface streams is called ground-water runoff or seepage flow from ground water.

Saline soil. A soil containing soluble salts in an amount that impairs growth of plants. A saline soil does not contain excess exchangeable sodium.

Sand. As a soil separate, individual rock or mineral fragments from 0.05 millimeter to 2.0 millimeters in diameter. Most sand grains consist of quartz. As a soil textural class, a soil that is 85 percent or more sand and not more than 10 percent clay.

Sandstone. Sedimentary rock containing dominantly sand-sized particles.

Saturation. Wetness characterized by zero or positive pressure of the soil water. Under conditions of saturation, the water will flow from the soil matrix into an unlined auger hole.

Sedimentary rock. Rock made up of particles deposited from suspension in water. The chief kinds of sedimentary rock are conglomerate, formed from gravel; sandstone, formed from sand; shale, formed from clay; and limestone, formed from soft masses of calcium carbonate. There are many intermediate types. Some wind-deposited sand is consolidated into sandstone.

Seepage (in tables). The movement of water through the soil. Seepage adversely affects the specified use.

Sequum. A sequence consisting of an illuvial horizon and the overlying eluvial horizon. (See Eluviation.)

Series, soil. A group of soils that have profiles that are almost alike, except for differences in texture of the surface layer. All the soils of a series have horizons that are similar in composition, thickness, and arrangement.

Shale. Sedimentary rock formed by the hardening of a clay deposit.

Sheet erosion. The removal of a fairly uniform layer of soil material from the land surface by the action of rainfall and surface runoff.

Shoulder. The position that forms the uppermost inclined surface near the top of a hillslope. It is a transition from backslope to summit. The surface is dominantly convex in profile and erosional in origin.

Shrink-swell (in tables). The shrinking of soil when dry and the swelling when wet. Shrinking and swelling can damage roads, dams, building foundations, and other structures. It can also damage plant roots.

Side slope. A geomorphic component of hills consisting of a laterally planar area of a hillside. The overland waterflow is predominantly parallel.

Silica. A combination of silicon and oxygen. The mineral form is called quartz.

Silt. As a soil separate, individual mineral particles that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). As a soil textural class, soil that is 80 percent or more silt and less than 12 percent clay.

Siltstone. Sedimentary rock made up of dominantly silt-sized particles.

Similar soils. Soils that share limits of diagnostic criteria, behave and perform in a similar manner, and have similar conservation needs or management requirements for the major land uses in the survey area.

Slickensides. Polished and grooved surfaces produced by one mass sliding past another. In soils, slickensides may occur at the bases of slip surfaces on the steeper slopes; on faces of blocks, prisms, and columns; and in swelling clayey soils, where there is marked change in moisture content.

Slickspot. A small area of soil having a puddled, crusted, or smooth surface and an excess of exchangeable sodium. The soil generally is silty or clayey, is slippery when wet, and is low in productivity.

Slippage (in tables). Soil mass susceptible to movement downslope when loaded, excavated, or wet.

Slope. The inclination of the land surface from the horizontal. Percentage of slope is the vertical distance divided by horizontal distance, then multiplied by 100. Thus, a slope of 20 percent is a drop of 20 feet in 100 feet of horizontal distance. In this survey, classes for simple slopes are as follows:

Nearly level	0 to 3 percent
Gently sloping	3 to 6 percent
Moderately sloping	6 to 15 percent
Moderately steep	15 to 30 percent
Steep	30 to 60 percent
Very steep	60 percent and higher

Slope (in tables). Slope is great enough that special practices are required to ensure satisfactory performance of the soil for a specific use.

Slow intake (in tables). The slow movement of water into the soil.

Slow refill (in tables). The slow filling of ponds, resulting from restricted permeability in the soil.

Small stones (in tables). Rock fragments less than 3 inches (7.6 centimeters) in diameter. Small stones adversely affect the specified use of the soil.

Sodic (alkali) soil. A soil having so high a degree of alkalinity (pH 8.5 or higher) or so high a percentage of exchangeable sodium (15 percent or more of the total exchangeable bases), or both, that plant growth is restricted.

Soft bedrock. Bedrock that can be excavated with trenching machines, backhoes, small rippers, and other equipment commonly used in construction.

Soil. A natural, three-dimensional body at the earth's surface. It is capable of supporting plants and has properties resulting from the integrated effect of climate and living matter acting on earthy parent material, as conditioned by relief over periods of time.

Soil separates. Mineral particles less than 2 millimeters in equivalent diameter and ranging between specified size limits. The names and sizes, in millimeters, of separates recognized in the United States are as follows:

Very coarse sand	2.0 to 1.0
Coarse sand	1.0 to 0.5

Medium sand	0.5 to 0.25
Fine sand	0.25 to 0.10
Very fine sand	0.10 to 0.05
Silt	0.05 to 0.002
Clay	less than 0.002

Solum. The upper part of a soil profile, above the C horizon, in which the processes of soil formation are active. The solum in soil consists of the A, E, and B horizons. Generally, the characteristics of the material in these horizons are unlike those of the material below the solum. The living roots and plant and animal activities are largely confined to the solum.

Stones. Rock fragments 10 to 24 inches (25 to 60 centimeters) in diameter if rounded or 15 to 24 inches (38 to 60 centimeters) in length if flat.

Stony. Refers to a soil containing stones in numbers that interfere with or prevent tillage.

Stripcropping. Growing crops in a systematic arrangement of strips or bands that provide vegetative barriers to wind erosion and water erosion.

Structure, soil. The arrangement of primary soil particles into compound particles or aggregates. The principal forms of soil structure are—*platy* (laminated), *prismatic* (vertical axis of aggregates longer than horizontal), *columnar* (prisms with rounded tops), *blocky* (angular or subangular), and *granular*. *Structureless* soils are either *single grained* (each grain by itself, as in dune sand) or *massive* (the particles adhering without any regular cleavage, as in many hardpans).

Stubble mulch. Stubble or other crop residue left on the soil or partly worked into the soil. It protects the soil from wind erosion and water erosion after harvest, during preparation of a seedbed for the next crop, and during the early growing period of the new crop.

Subsoil. Technically, the B horizon; roughly, the part of the solum below plow depth.

Subsoiling. Tilling a soil below normal plow depth, ordinarily to shatter a hardpan or claypan.

Substratum. The part of the soil below the solum.

Subsurface layer. Any surface soil horizon (A, E, AB, or EB) below the surface layer.

Summer fallow. The tillage of uncropped land during the summer to control weeds and allow storage of moisture in the soil for the growth of a later crop. A practice common in semiarid regions, where annual precipitation is not enough to produce a crop every year. Summer fallow is frequently practiced before planting winter grain.

Summit. The topographically highest position of a hillslope. It has a nearly level (planar or only slightly convex) surface.

Surface layer. The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, ranging in depth from 4 to 10 inches (10 to 25 centimeters). Frequently designated as the "plow layer," or the "Ap horizon."

Surface soil. The A, E, AB, and EB horizons, considered collectively. It includes all subdivisions of these horizons.

Syncline. A geologic unit of folded strata that are concave upward.

Taxadjuncts. Soils that cannot be classified in a series recognized in the classification system. Such soils are named for a series they strongly resemble and are designated as taxadjuncts to that series because they differ in ways too small to be of consequence in interpreting their use and behavior. Soils are recognized as taxadjuncts only when one or more of their characteristics are slightly outside the range defined for the family of the series for which the soils are named.

Terrace. An embankment, or ridge, constructed across sloping soils on the contour or at a slight angle to the contour. The terrace intercepts surface runoff so that water soaks into the soil or flows slowly to a prepared outlet. A terrace in a field generally is built so that the field can be farmed. A terrace intended mainly for drainage has a deep channel that is maintained in permanent sod.

Terrace (geologic). An old alluvial plain, ordinarily flat or undulating, bordering a river, a lake, or the sea.

Tertiary age. The period of the Cenozoic Era of geologic time from approximately 65 million to 2 million years ago.

Texture, soil. The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are *sand, loamy sand, sandy loam, loam, silt loam, silt, sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay,* and *clay*. The sand, loamy sand, and sandy loam classes may be further divided by specifying "coarse," "fine," or "very fine."

Thin layer (in tables). Otherwise suitable soil material that is too thin for the specified use.

Tilth, soil. The physical condition of the soil as related to tillage, seedbed preparation, seedling emergence, and root penetration.

Toeslope. The position that forms the gently inclined surface at the base of a hillslope. Toeslopes in profile are commonly gentle and linear and are constructional surfaces forming the lower part of a hillslope continuum that grades to valley or closed-depression floors.

Too arid (in tables). The soil is dry most of the time, and vegetation is difficult to establish.

Topsoil. The upper part of the soil, which is the most favorable material for plant growth. It is ordinarily rich in organic matter and is used to topdress roadbanks, lawns, and land affected by mining.

Toxicity (in tables). Excessive amount of toxic substances, such as sodium or sulfur, that severely hinder establishment of vegetation or severely restrict plant growth.

Trace elements. Chemical elements, for example, zinc, cobalt, manganese, copper, and iron, in soils in extremely small amounts. They are essential to plant growth.

Underlying material. That part of a soil profile below the surface layer when no subsoil is present. Technically, the C horizon in an A-C soil profile.

Unstable fill (in tables). Risk of caving or sloughing on banks of fill material.

Upland. Land at a higher elevation, in general, than the alluvial plain or stream terrace; land above the lowlands along streams.

Variegation. Refers to patterns of contrasting colors assumed to be inherited from the parent material rather than to be the result of poor drainage.

Weathering. All physical and chemical changes produced in rocks or other deposits at or near the earth's surface by atmospheric agents. These changes result in disintegration and decomposition of the material.

Well graded. Refers to soil material consisting of coarse grained particles that are well distributed over a wide range in size or diameter. Such soil normally can be easily increased in density and bearing properties by compaction. Contrasts with poorly graded soil.

Windthrow. The uprooting and tipping over of trees by the wind.

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Nondiscrimination Statement

Nondiscrimination Policy

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program information (e.g., Braille, large print, audiotape, etc.), please contact USDA's TARGET Center at (202) 720-2600 (voice and TDD).

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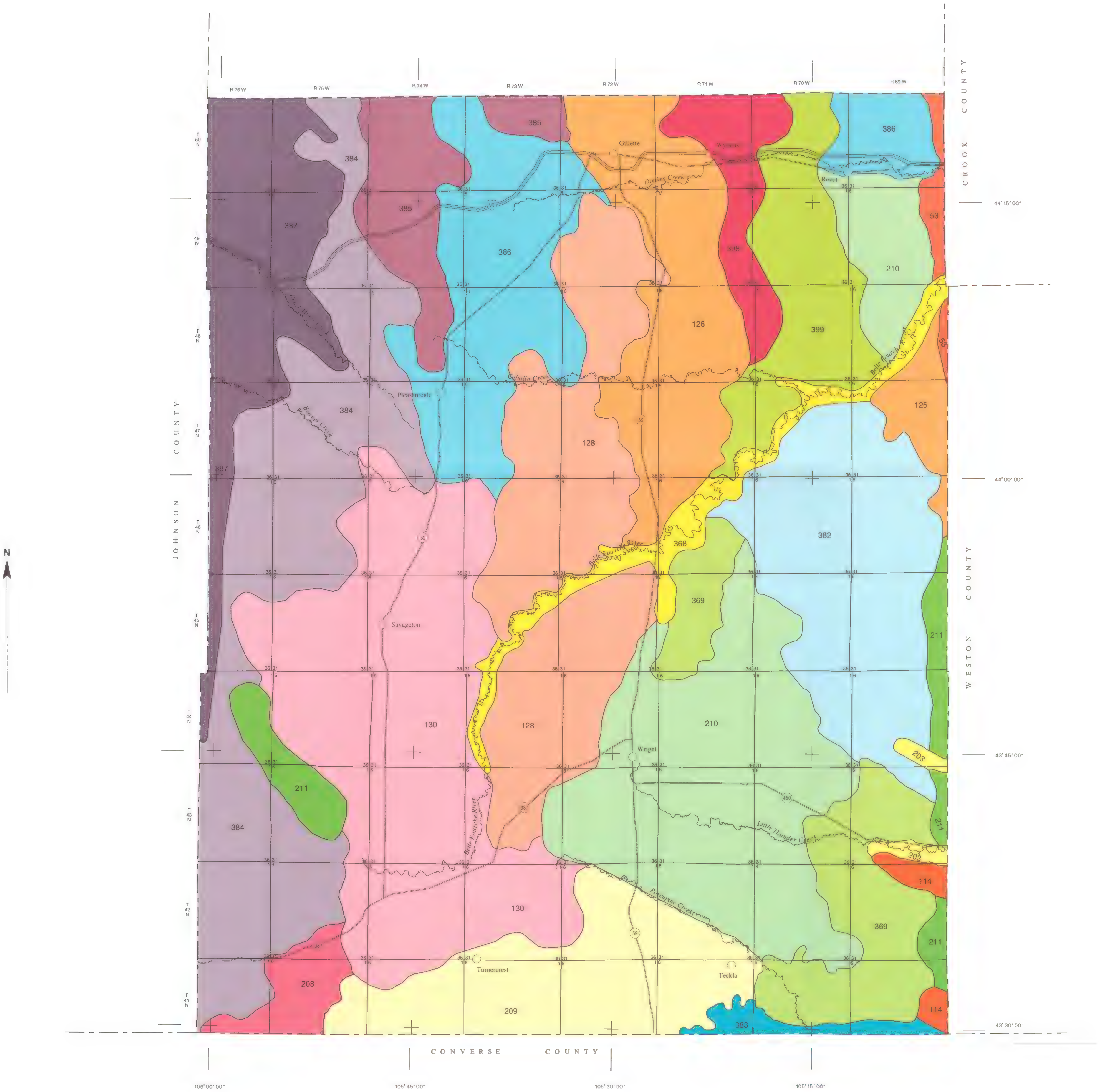
All Other Inquiries

For information not pertaining to civil rights, please refer to the listing of the USDA Agencies and Offices (http://directives.sc.egov.usda.gov/33086.wba).



SOIL LEGEND*

	SOILS ON THE UPLANDS		
53	Cushman-Forkwood-Shingle association	382	Hilight-Wags-Wibaux association
114	Forkwood-Terro-Cushman association		Shingle-Wibaux-Badland association
126	Arwite-Vonalf-Moorhead association	384	Cambria-Theedle-Kishona association
128	Renohill-Cushman-Shingle association		Ucross-Deekay-Fairburn association
130	Forkwood-Ulm-Cushman association	386	Deekay-Moorhead-Oldwolf association
208	Samday-Shingle-Badland association		Theedle-Shingle-Samday association
209	Hiland-Ulm-Shingle association		Ironbutte-Jaywest-Rockybutte association
210	Bidman-Parmleed-Arvada association	399	Lismas-Sabatka-Ironbutte association
211	Bowbac-Cushman-Taluce association		SOILS ON THE LOWLANDS
369	Wibaux-Bidman-Teckla association	203	Clarkelen-Bidman association
		368	Harverdad-Kishona-Forkwood association

*The units on this legend are described in the text under the heading "General Soil Map Units."

Compiled 2002

SECTIONALIZED TOWNSHIP

6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

UNITED STATES DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE
WYOMING AGRICULTURAL EXPERIMENT STATION
UNITED STATES DEPARTMENT OF AGRICULTURE,
FOREST SERVICE

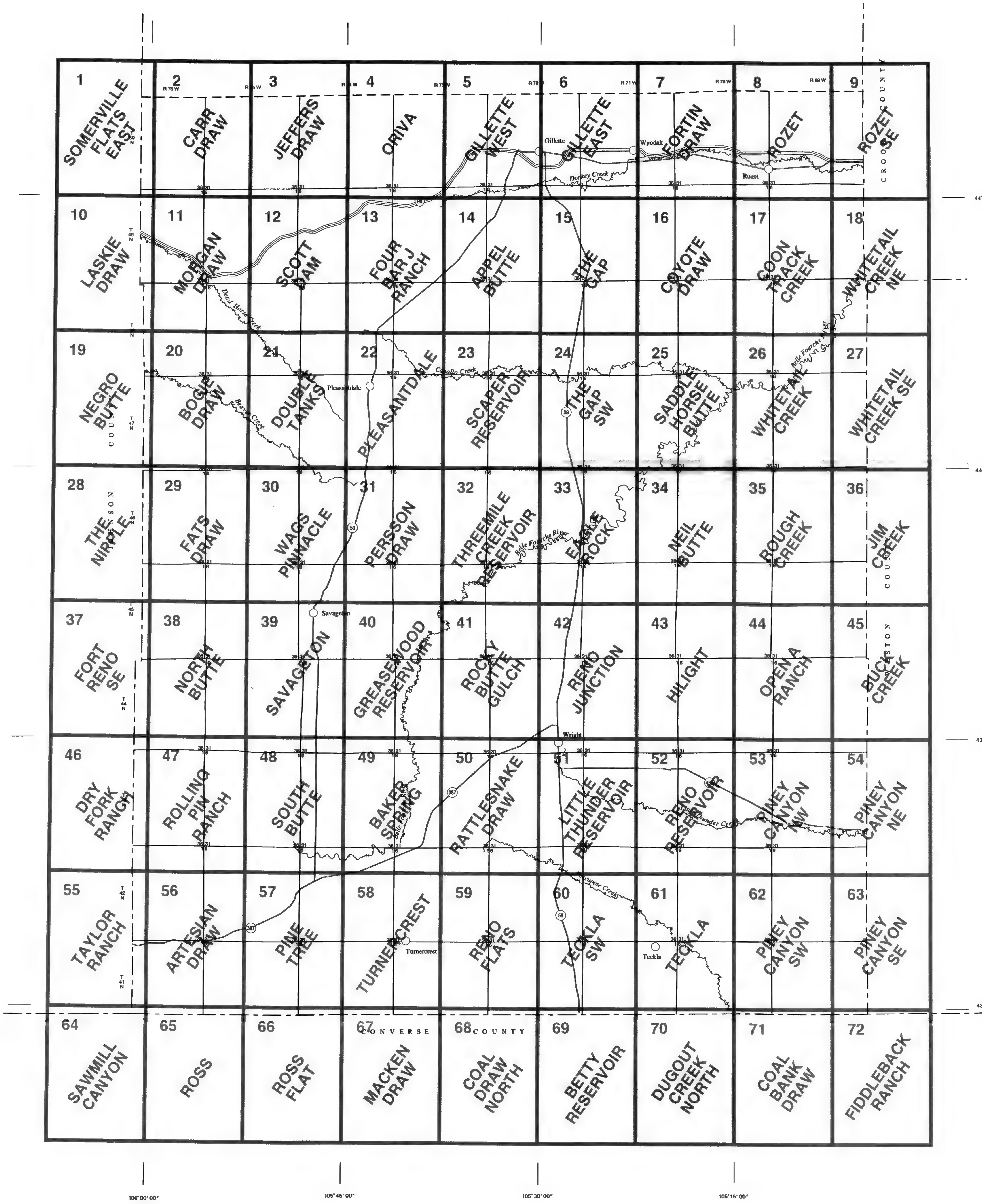
GENERAL SOIL MAP
CAMPBELL COUNTY, WYOMING (Southern Part)

Scale 1:253440

MILES

KILOMETERS

Each area outlined on this map consists of more than one kind of soil. The map is meant for general planning rather than a basis for decisions on the use of specific tracts.



SECTIONALIZED TOWNSHIP

6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

INDEX TO MAP SHEETS
CAMPBELL COUNTY, WYOMING (Southern Part)

Scale 1:253440

MILES

KILOMETERS

SOIL LEGEND

The publication symbols are in numerical order that matches the alphabetical listing of the approved map unit names.

SYMBOL	NAME
100	Aridic Ustorthents, saline, 0 to 4 percent slopes
101	Arvada, thick surface very fine sandy loam, 0 to 6 percent slopes
102	Arvada, thick surface-Arvada-Slickspots complex, 0 to 6 percent slopes
103	Arwite fine sandy loam, 0 to 6 percent slopes
104	Arwite fine sandy loam, 6 to 15 percent slopes
105	Arwite-Elwop fine sandy loams, 0 to 6 percent slopes
106	Arwite-Elwop fine sandy loams, 6 to 15 percent slopes
107	Arwite-Vonalf fine sandy loams, 0 to 6 percent slopes
108	Arwite-Vonalf fine sandy loams, 6 to 15 percent slopes
109	Bidman loam, 0 to 6 percent slopes
110	Bidman loam, loamy substratum, 0 to 6 percent slopes
111	Bidman-Parmleed loams, 0 to 6 percent slopes
112	Bidman-Parmleed loams, 6 to 15 percent slopes
113	Bidman-Ulm loams, 0 to 6 percent slopes
114	Bowbac-Taluce-Badland complex, 3 to 20 percent slopes
115	Bowbac-Worf fine sandy loams, 3 to 15 percent slopes
116	Cambria-Kishona-Zigweid loams, 0 to 6 percent slopes
117	Cambria-Kishona-Zigweid loams, 6 to 15 percent slopes
118	Clarkelen-Draknab complex, 0 to 3 percent slopes
119	Clarkelen-Embry fine sandy loams, 0 to 4 percent slopes
120	Clarkelen-Keeline association, 0 to 6 percent slopes
121	Cushman-Cambria loams, 0 to 6 percent slopes
122	Cushman-Cambria loams, 6 to 15 percent slopes
123	Cushman-Renohill loams, 6 to 15 percent slopes
124	Cushman-Shingle loams, 6 to 15 percent slopes
125	Cushman-Terro complex, 6 to 15 percent slopes
126	Cushman-Theedle loams, 0 to 6 percent slopes
127	Cushman-Theedle loams, 6 to 15 percent slopes
128	Cushman-Worf loams, 3 to 15 percent slopes
129	Decolney-Hiland fine sandy loams, 0 to 6 percent slopes
130	Decolney-Hiland fine sandy loams, 6 to 15 percent slopes
131	Deekay loam, 0 to 6 percent slopes
132	Deekay-Moorhead loams, 0 to 6 percent slopes
133	Deekay-Moorhead loams, 6 to 15 percent slopes
134	Deekay-Oldwolf loams, 0 to 6 percent slopes
135	Deekay-Oldwolf loams, 6 to 15 percent slopes
136	Deekay-Ziggy loams, 0 to 6 percent slopes
137	Echeta clay loam, 0 to 6 percent slopes
138	Echeta-Cromack clay loams, 6 to 15 percent slopes
139	Embry-Orpha complex, 3 to 15 percent slopes
140	Embry-Taluce sandy loams, 3 to 20 percent slopes
141	Emigha loam, 0 to 3 percent slopes
142	Emigha, sodic-Arvada, thick surface complex, 0 to 4 percent slopes
143	Felix clay, ponded, 0 to 2 percent slopes
144	Forkwood loam, 0 to 6 percent slopes
145	Forkwood-Cambria loams, 0 to 6 percent slopes
146	Forkwood-Cushman loams, 0 to 6 percent slopes
147	Forkwood-Cushman loams, 6 to 15 percent slopes
148	Forkwood-Ulm loams, 0 to 6 percent slopes
149	Forkwood-Ulm loams, 6 to 15 percent slopes
150	Gateson-Taluce-Turnercrest complex, 6 to 30 percent slopes
151	Haverdad loam, 0 to 3 percent slopes
152	Haverdad-Clarkelen complex, 0 to 4 percent slopes
153	Haverdad-Kishona association, 0 to 6 percent slopes
154	Heldt clay loam, 0 to 6 percent slopes
155	Heldt-Bidman complex, saline, 0 to 3 percent slopes
156	Hiland fine sandy loam, 0 to 6 percent slopes
157	Hiland-Bowbac fine sandy loams, 0 to 6 percent slopes
158	Hiland-Bowbac fine sandy loams, 6 to 15 percent slopes
159	Hiland-Vonalee fine sandy loams, 0 to 6 percent slopes
160	Hiland-Vonalee fine sandy loams, 6 to 15 percent slopes
161	Hilight-Taluce, cool-Wags complex, 6 to 40 percent slopes
162	Lismas-Mittenbutte, cool-Sabatka complex, 6 to 40 percent slopes
163	Hilight-Wags-Badland complex, 3 to 45 percent slopes
164	Lismas-Sabatka-Badland complex, 3 to 45 percent slopes
165	Javem fine sandy loam, 6 to 20 percent slopes
166	Jaywest loam, 0 to 6 percent slopes
167	Jaywest-Moorhead loams, 0 to 6 percent slopes
168	Jaywest-Spottedhorse loams, 0 to 6 percent slopes
169	Julesburg fine sandy loam, 0 to 6 percent slopes
170	Keeline-Tullock loamy sands, 6 to 30 percent slopes
171	Keeline-Tullock-Niobrara, dry complex, 3 to 30 percent slopes
172	Keyner fine sandy loam, 0 to 6 percent slopes
173	Lawver-Teckla-Wibaux complex, 0 to 6 percent slopes
174	Brislawn-Rockybutte-Ironbutte complex, 0 to 10 percent slopes
175	Lawver-Wibaux complex, 6 to 30 percent slopes
176	Leiter-Cromack clay loams, 3 to 15 percent slopes
177	Maysdorf fine sandy loam, 0 to 6 percent slopes
178	Maysdorf sandy clay loam, 0 to 6 percent slopes
179	Maysdorf-Pugsley sandy loams, 0 to 6 percent slopes
180	Maysdorf-Pugsley sandy loams, 6 to 15 percent slopes
181	Moorhead clay loam, 0 to 6 percent slopes
182	Moorhead loam, 0 to 6 percent slopes
183	Moorhead-Leiter clay loams, 0 to 6 percent slopes
184	Moorhead-Leiter clay loams, 6 to 15 percent slopes
185	Moskee fine sandy loam, 0 to 6 percent slopes
186	Moskee fine sandy loam, 6 to 10 percent slopes
187	Nuncho loam, 0 to 6 percent slopes
188	Orpha-Tullock loamy sands, 6 to 30 percent slopes
189	Oshoto-Moorhead loams, 0 to 6 percent slopes
190	Parmleed-Renohill complex, 3 to 15 percent slopes
191	Pits-Dumps complex
192	Platmak loam, 0 to 6 percent slopes
193	Pugsley-Decolney sandy loams, 0 to 6 percent slopes
194	Pugsley-Decolney sandy loams, 6 to 15 percent slopes
195	Rauzi fine sandy loam, 0 to 6 percent slopes
196	Rauzi sandy clay loam, 0 to 6 percent slopes
197	Rauzi-Elwop fine sandy loams, 2 to 10 percent slopes
198	Recluse loam, 0 to 6 percent slopes
199	Renohill-Savageton clay loams, 0 to 6 percent slopes
200	Renohill-Savageton clay loams, 6 to 15 percent slopes
201	Renohill-Shingle-Worf complex, 3 to 15 percent slopes
202	Renohill-Worfka clay loams, 3 to 15 percent slopes
203	Rockypoint-Iwait association, 0 to 6 percent slopes
204	Samday-Samday, cool-Shingle clay loams, 6 to 40 percent slopes
205	Samday-Savageton clay loams, 3 to 15 percent slopes
206	Samday Shingle-Badland complex, 10 to 45 percent slopes
207	Cromack-Fairburn-Ucross complex, 3 to 20 percent slopes
208	Savageton-Silhouette clay loams, 0 to 6 percent slopes
209	Savageton-Silhouette clay loams, 6 to 15 percent slopes
210	Shingle-Taluce complex, 3 to 30 percent slopes
211	Shingle-Worf loams, 3 to 30 percent slopes
212	Teckla very fine sandy loam, 0 to 10 percent slopes
213	Terro-Taluce sandy loams, 6 to 30 percent slopes
214	Theedle-Kishona loams, 0 to 6 percent slopes
215	Theedle-Kishona loams, 6 to 20 percent slopes
216	Theedle-Kishona-Shingle loams, 3 to 30 percent slopes
217	Theedle-Shingle loams, 3 to 30 percent slopes
218	Theedle-Turnercrest-Kishona complex, 3 to 15 percent slopes
219	Torriarents-Torriorthents complex, reclaimed
220	Pitchdraw-Ashollow-Niobrara complex, 3 to 30 percent slopes
221	Turnercrest-Keeline-Taluce fine sandy loams, 6 to 30 percent slopes
222	Turnercrest-Wibaux, thin solum-Taluce complex, 6 to 40 percent slopes
223	Ucross loam, 1 to 9 percent slopes
224	Ucross-Iwait loams, 0 to 6 percent slopes
225	Ucross-Iwait-Fairburn loams, 3 to 30 percent slopes
226	Ulm loam, 0 to 6 percent slopes
227	Ulm clay loam, 0 to 6 percent slopes
228	Ulm-Renohill clay loams, 0 to 6 percent slopes
229	Ulm-Renohill clay loams, 6 to 15 percent slopes
230	Urban land-Deekay-Moorhead complex, 0 to 6 percent slopes
231	Urban land-Leiter-Moorhead complex, 3 to 10 percent slopes
232	Urban land-Pitchdraw-Ashollow complex, 6 to 15 percent slopes
233	Ustic Torriorthents, gullied
234	Ustic Torriorthents-Badland complex, 10 to 100 percent slopes
235	Vonalee fine sandy loam, 0 to 10 percent slopes
236	Vonalee-Terro fine sandy loams, 2 to 10 percent slopes
237	Vonalf fine sandy loam, 0 to 6 percent slopes
238	Vonalf-Xema fine sandy loams, 3 to 10 percent slopes
239	Ironbutte-Fairburn-Mittenbutte complex, 6 to 40 percent slopes
240	Wibaux-Wibaux, thin solum complex, 6 to 40 percent slopes
241	Ironbutte-Ironbutte, thin solum channery loams, 6 to 40 percent slopes
242	Ironbutte-Deekay-Moorhead association, 3 to 30 percent slopes
243	Wibaux, thick solum-Wibaux channery fine sandy loams, 3 to 40 percent slopes
244	Muleherder-Ironbutte channery loams, 3 to 40 percent slopes
245	Wibaux-Shingle-Badland complex, 6 to 60 percent slopes
246	Wyarno-Ulm clay loams, 0 to 6 percent slopes
247	Wyotite-Ulm loams, 0 to 6 percent slopes
248	Ziggy-Iwait loams, 0 to 6 percent slopes
249	Ziggy-Iwait loams, 6 to 15 percent slopes
250	Ziggy-Ucross-Oldwolf loams, 3 to 15 percent slopes
251	Water

CONVENTIONAL AND SPECIAL SYMBOLS LEGEND

CULTURAL FEATURES

BOUNDARIES

- County or parish
- Reservation (national forest or park, state forest or park, and large airport)
- Limit of soil survey (label)
- Field sheet matchline and neatline

LAND DIVISION CORNER (sections and land grants)

ROADS

- Names or numbers only

ROAD EMBLEM & DESIGNATIONS

- Interstate — 173
- Federal — 287
- State — 52
- County, farm or ranch — 1283

RAILROAD — Name only

PITS

- Gravel pit
- Mine or quarry

WATER FEATURES

LAKES, PONDS AND RESERVOIRS

- Perennial — water, w

MISCELLANEOUS WATER FEATURES

- Marsh or swamp
- Wet spot

SPECIAL SYMBOLS FOR SOIL SURVEY

SOIL DELINEATIONS AND SYMBOLS — 147, 204

SHORT STEEP SLOPE

GULLY

MISCELLANEOUS

- Blowout
- Clay spot
- Gravelly spot
- Gumbo, slick or scabby spot (sodic)
- Prominent hill or peak
- Rock outcrop (includes sandstone and shale)
- Saline spot
- Sandy spot
- Severely eroded spot
- Closed depression
- Porcelanite hill
- Playa

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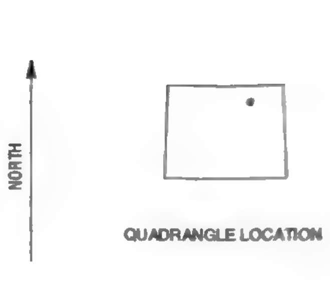
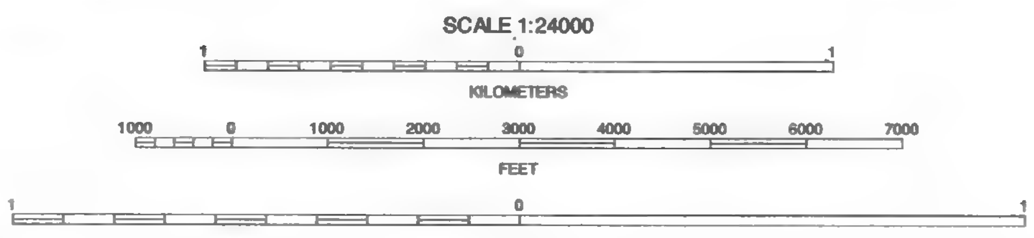
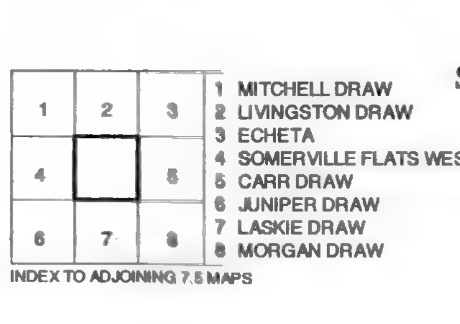
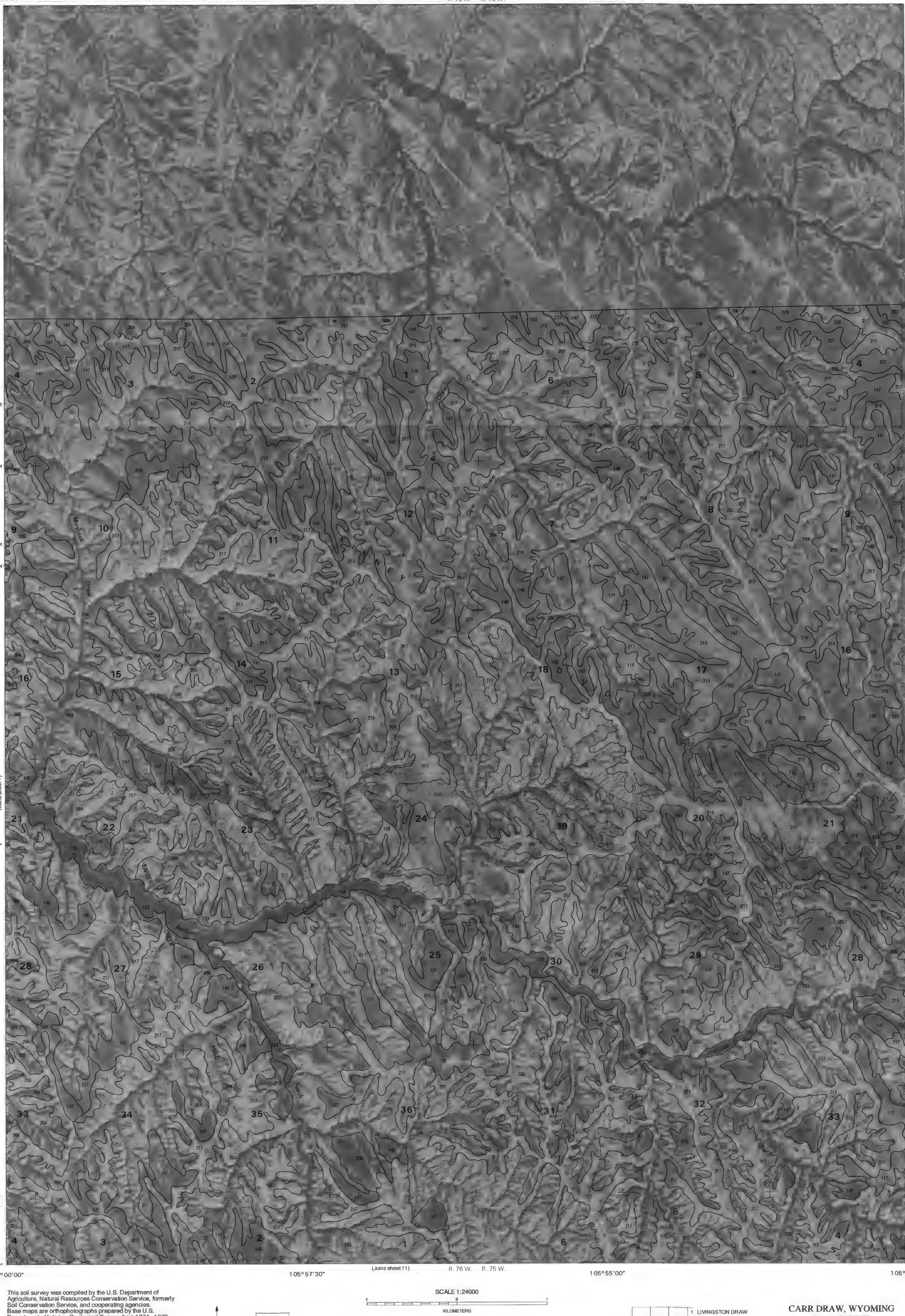
North American Datum of 1927 (NAD27). Clarke 1866 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.







SOMERVILLE FLATS EAST, WYOMING
7.5 MINUTE SERIES
SHEET NUMBER 1 OF 72



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NORTH

QUADRANGLE LOCATION

SCALE 1:24000

KILOMETERS

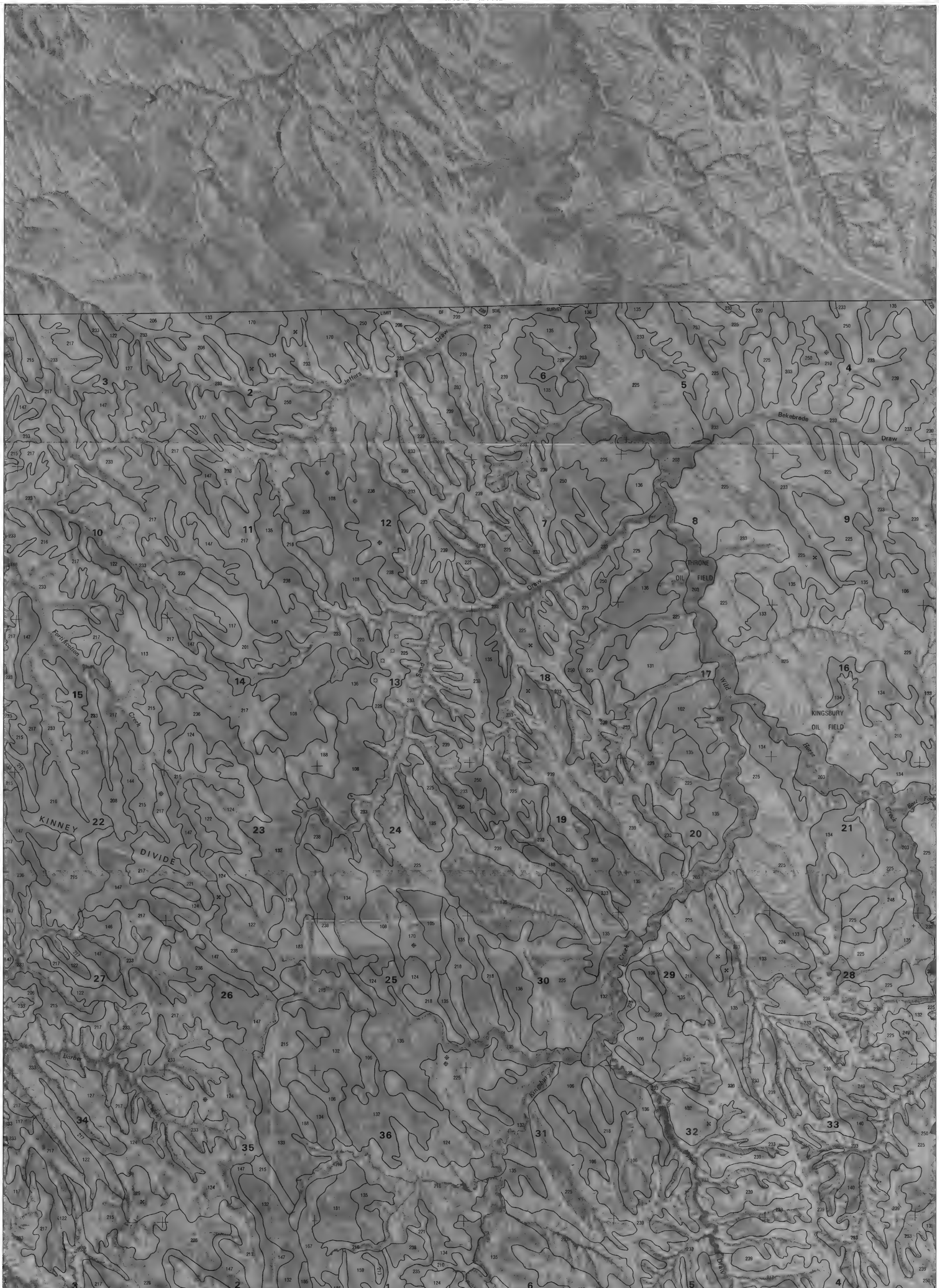
FEET

MILES

1	2	3
4		5
6	7	8

1 LIVINGSTON DRAW
2 ECHETA
3 TWENTYMILE BUTTE
4 SOMERVILLE FLATS EAST
5 JEFFERS DRAW
6 LASKIE DRAW
7 MORGAN DRAW
8 SCOTT DAM

INDEX TO ADJOINING 7.5 MAPS



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NORTH

QUADRANGLE LOCATION

SCALE 1:24000

KILOMETERS

1000 0 1000 2000 3000 4000 5000 6000 7000
FEET

MILES

1	2	3
4		5
6	7	8

1 ECHETA
2 TWENTYMILE BUTTE
3 ORIVA NW
4 CARR DRAW
5 ORIVA
6 MORGAN DRAW
7 SCOTT DAM
8 FOUR BAR J RANCH

INDEX TO ADJOINING 7.5 MAPS

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NORTH

QUADRANGLE LOCATION

SCALE 1:24000

KILOMETERS

FEET

MILES

1 TWENTYMILE BUTTE
2 ORIVA NW
3 RAWHIDE SCHOOL
4 JEFFERS DRAW
5 GILLETTE WEST
6 SCOTT DAM
7 FOUR BAR J RANCH
8 APPEL BUTTE

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ORIVA, WYOMING
7.5 MINUTE SERIES
SHEET NUMBER 4 OF 72

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NORTH

QUADRANGLE LOCATION

SCALE 1:24000

KILOMETERS: 1 0 1

FEET: 1000 0 1000 2000 3000 4000 5000 6000 7000

MILES: 1 0 1

1	2	3
4		5
6	7	8

1 ORIVA NW
2 RAWHIDE SCHOOL
3 MOYER SPRINGS
4 ORIVA
5 GILLETTE EAST
6 FOUR BAR J RANCH
7 APPEL BUTTE
8 THE GAP

INDEX TO ADJOINING 7.5 MAPS

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NORTH

QUADRANGLE LOCATION

SCALE 1:24000

KILOMETERS

FEET

MILES

1	2	3
4		5
6	7	8

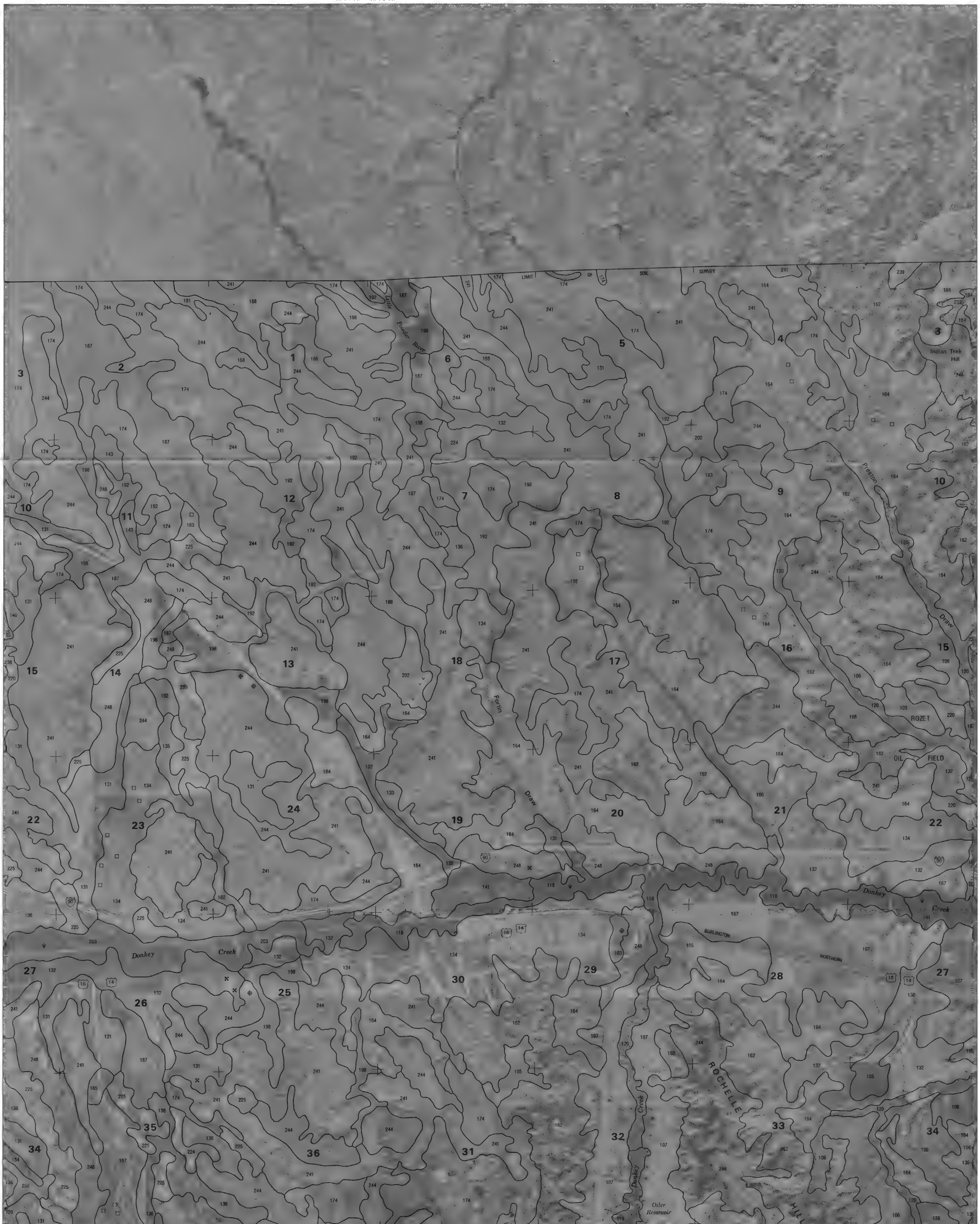
1 RAWHIDE SCHOOL
2 MOYER SPRINGS
3 GREEN HILL
4 GILLETTE WEST
5 FORTIN DRAW
6 APPEL BUTTE
7 THE GAP
8 COYOTE DRAW

INDEX TO ADJOINING 7.5 MAPS

GILLETTE EAST, WYOMING
7.5 MINUTE SERIES
SHEET NUMBER 6 OF 72

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

CAMPBELL COUNTY, WYOMING, SOUTHERN PART
FORTIN DRAW QUADRANGLE
SHEET NUMBER 7 OF 72



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NORTH

QUADRANGLE LOCATION

SCALE 1:24000

KILOMETERS

FEET

MILES

1	2	3
4		5
6	7	8

1 MOYER SPRINGS
2 GREEN HILL
3 ROZET NW
4 GILLETTE EAST
5 ROZET
6 THE GAP
7 COYOTE DRAW
8 COON TRACK CREEK

INDEX TO ADJOINING 7.5 MAPS

FORTIN DRAW, WYOMING
7.5 MINUTE SERIES
SHEET NUMBER 7 OF 72

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NORTH

QUADRANGLE LOCATION

SCALE 1:24000

KILOMETERS

FEET

MILES

1	2	3
4		5
6	7	8

1 GREEN HILL
2 ROZET NW
3 ROZET NE
4 FORTIN DRAW
5 ROZET SE
6 COYOTE DRAW
7 COON TRACK CREEK
8 WHITETAIL CREEK NE

INDEX TO ADJOINING 7.5 MAPS

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

CAMPBELL COUNTY, WYOMING, SOUTHERN PART
ROZET SE QUADRANGLE
SHEET NUMBER 9 OF 72

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NORTH

QUADRANGLE LOCATION

SCALE 1:24000

1 0 1
KILOMETERS

1000 0 1000 2000 3000 4000 5000 6000 7000
FEET

1 0 1
MILES

1	2	3
4		5
6	7	8

1 ROZET NW
2 ROZET NE
3 EDITH CREEK
4 ROZET
5 MOORCROFT
6 COON TRACK CREEK
7 WHITETAIL CREEK NE
8 SPYGLASS HILL

INDEX TO ADJOINING 7.5 MAPS

ROZET SE, WYOMING
7.5 MINUTE SERIES
SHEET NUMBER 9 OF 72

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NORTH

QUADRANGLE LOCATION

SCALE 1:24000

KILOMETERS

FEET

MILES

INDEX TO ADJOINING 7.5 MAPS

1 SOMERVILLE FLATS WEST
2 SOMERVILLE FLATS EAST
3 CARR DRAW
4 JUNIPER DRAW
5 MORGAN DRAW
6 BOWMAN FLAT
7 NEGRO BUTTE
8 BOGIE DRAW

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North American Datum of 1927 (NAD27). Clarke 1866 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUADRANGLE LOCATION

SCALE 1:24000

1 0 1
KILOMETERS

1000 0 1000 2000 3000 4000 5000 6000 7000
FEET

1 0 1
MILES

1	2	3
4		5
6	7	8

1 SOMERVILLE FLATS EAST
2 CARR DRAW
3 JEFFERS DRAW
4 LASKIE DRAW
5 SCOTT DAM
6 NEGRO BUTTE
7 BOGIE DRAW
8 DOUBLE TANKS

INDEX TO ADJOINING 7.5 MAPS

MORGAN DRAW, WYOMING
7.5 MINUTE SERIES
SHEET NUMBER 11 OF 72

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

CAMPBELL COUNTY, WYOMING, SOUTHERN PART
SCOTT DAM QUADRANGLE
SHEET NUMBER 12 OF 72

105°52'30" 105°50'00" R. 75 W. R. 74 W. (Joins sheet 3) 105°47'30" 105°45'00"

44°15'00" 44°15'00"

44°12'30" 44°12'30"

(Joins sheet 11) (Joins sheet 13)

T. 49 N.
T. 48 N.

44°10'00" 44°10'00"

44°07'30" 44°07'30"

105°52'30" 105°50'00" (Joins sheet 21) R. 75 W. R. 74 W. 105°47'30" 105°45'00"

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NORTH

QUADRANGLE LOCATION

SCALE 1:24000

1 0 1
KILOMETERS

1000 0 1000 2000 3000 4000 5000 6000 7000
FEET

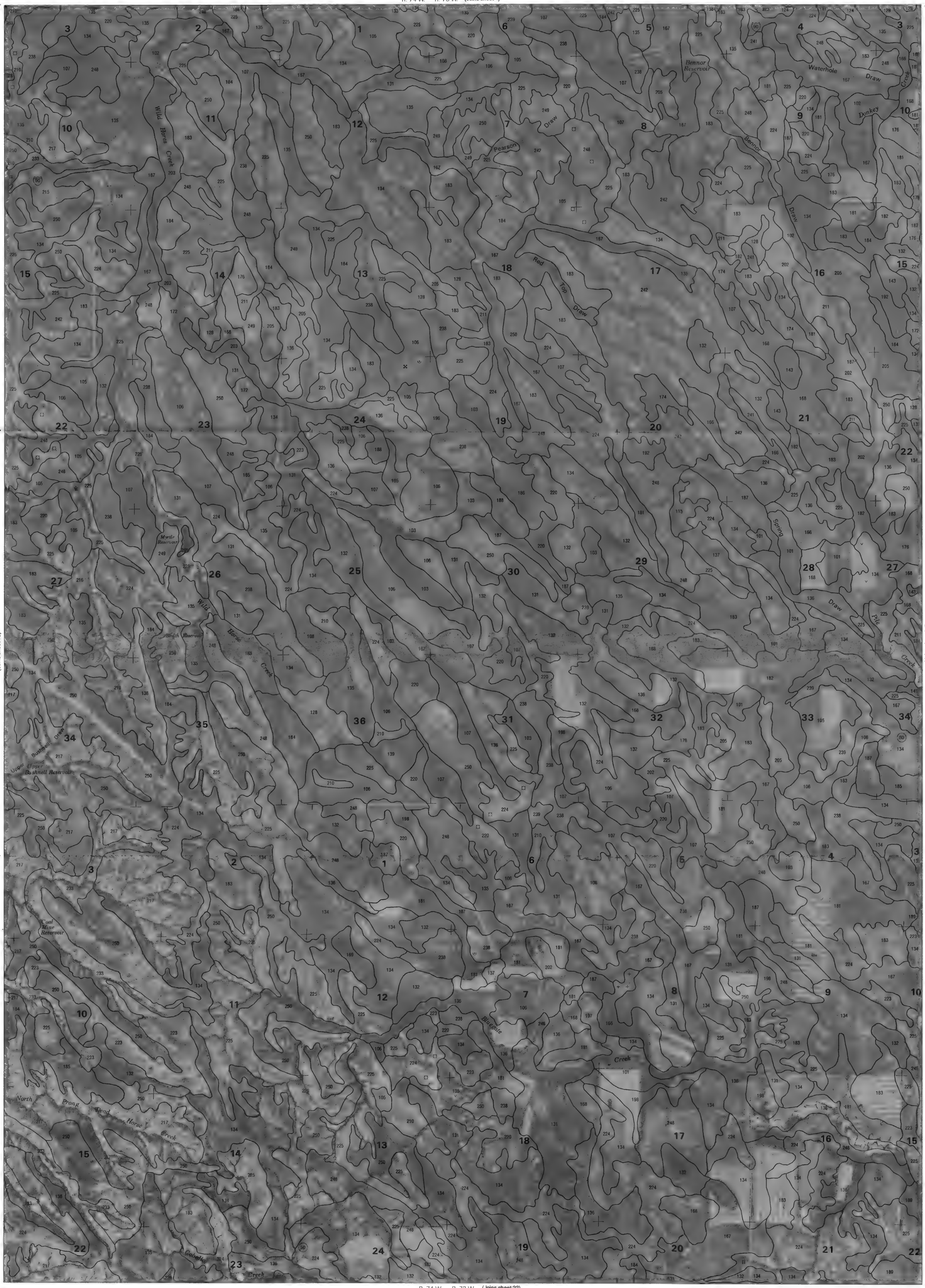
1 0 1
MILES

1	2	3
4		5
6	7	8

1 CARR DRAW
2 JEFFERS DRAW
3 ORIVA
4 MORGAN DRAW
5 FOUR BAR J RANCH
6 BOGIE DRAW
7 DOUBLE TANKS
8 PLEASANTDALE

INDEX TO ADJOINING 7.5 MAPS

SCOTT DAM, WYOMING
7.5 MINUTE SERIES
SHEET NUMBER 12 OF 72



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North American Datum of 1927 (NAD27). Clarke 1866 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUADRANGLE LOCATION

SCALE 1:24000

KILOMETERS

FEET

MILES

1 JEFFERS DRAW
2 ORIVA
3 GILLETTE WEST
4 SCOTT DAM
5 APPEL BUTTE
6 DOUBLE TANKS
7 PLEASANTDALE
8 SCAPER RESERVOIR

INDEX TO ADJOINING 7.5 MAPS

FOUR BAR J RANCH, WYOMING
7.5 MINUTE SERIES
SHEET NUMBER 13 OF 72

This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service, formerly Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey, from 1974 - 1979 aerial photography.

North American Datum of 1927 (NAD27). Clarke 1866 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUADRANGLE LOCATION

SCALE 1:24000

KILOMETERS

FEET

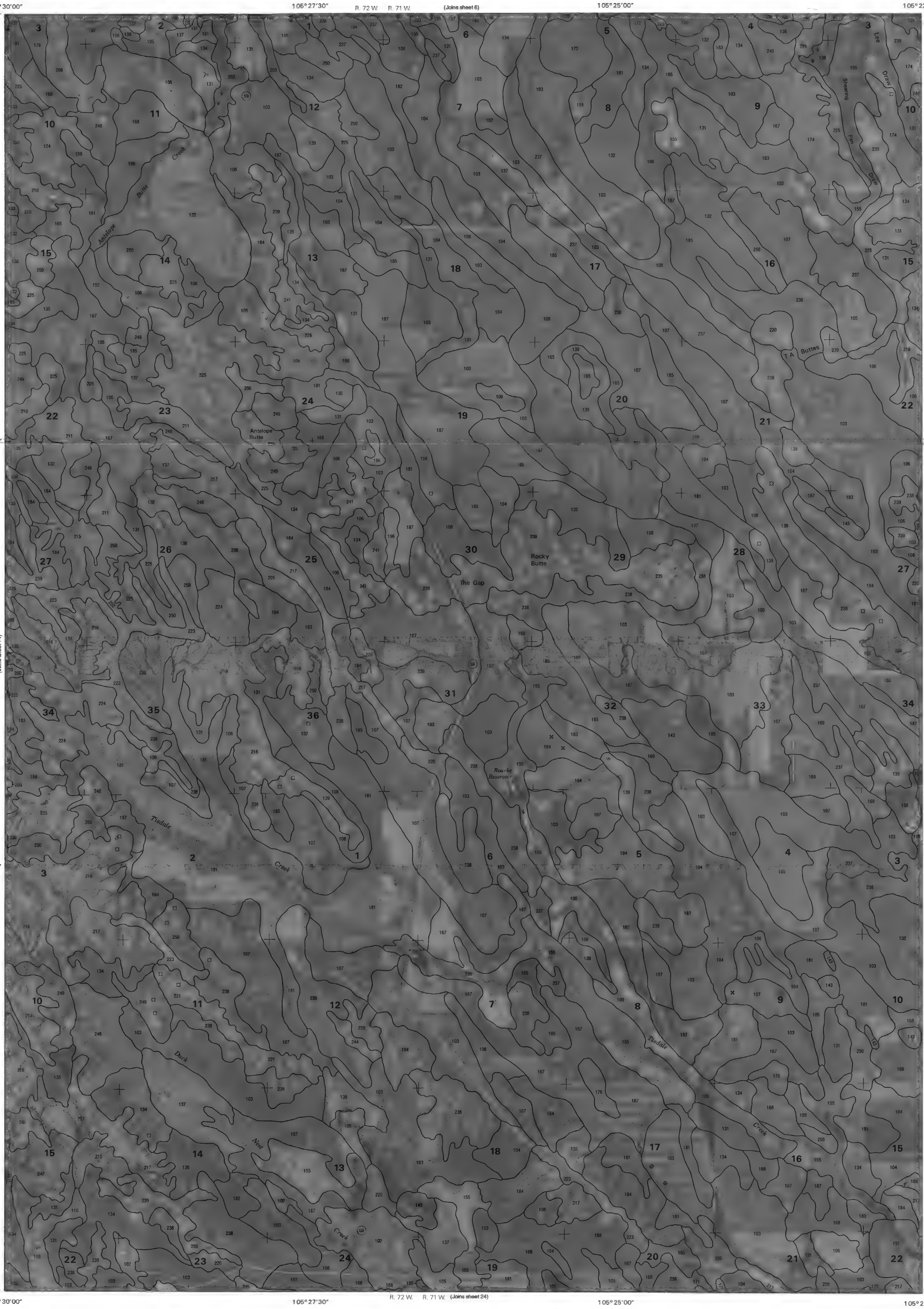
MILES

1	2	3
4		5
6	7	8

1 ORIVA
2 GILLETTE WEST
3 GILLETTE EAST
4 FOUR BAR J RANCH
5 THE GAP
6 PLEASANTDALE
7 SCAPER RESERVOIR
8 THE GAP SW

INDEX TO ADJOINING 7.5 MAPS

APPEL BUTTE, WYOMING
7.5 MINUTE SERIES
SHEET NUMBER 14 OF 72



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North American Datum of 1927 (NAD27). Clarke 1866 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUADRANGLE LOCATION

SCALE 1:24000

KILOMETERS

FEET

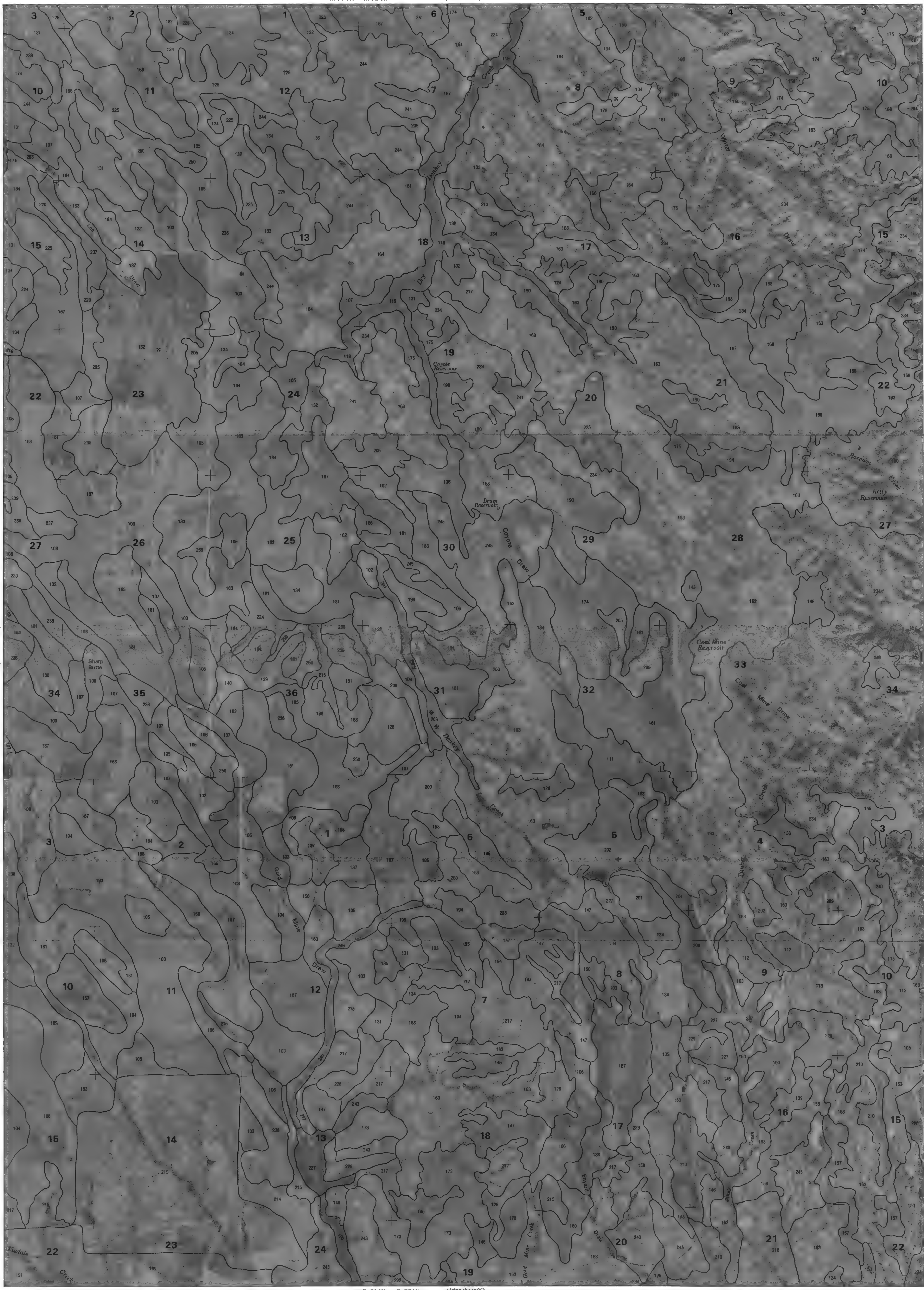
MILES

1	2	3
4		5
6	7	8

1 GILLETTE WEST
2 GILLETTE EAST
3 FORTIN DRAW
4 APPEL BUTTE
5 COYOTE DRAW
6 SCAPER RESERVOIR
7 THE GAP SW
8 SADDLE HORSE BUTTE

INDEX TO ADJOINING 7.5 MAPS

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE



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North American Datum of 1927 (NAD27). Clarke 1866 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUADRANGLE LOCATION

SCALE 1:24000

KILOMETERS

FEET

MILES

1	2	3
4		5
6	7	8

1 GILLETTE EAST
2 FORTIN DRAW
3 ROZET
4 THE GAP
5 COON TRACK CREEK
6 THE GAP SW
7 SADDLE HORSE BUTTE
8 WHITETAIL CREEK

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UNITED STATES
DEPARTMENT OF AGRICULTURE
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NORTH

QUADRANGLE LOCATION

SCALE 1:24000

KILOMETERS

FEET

MILES

1	2	3
4		5
6	7	8

1 FORTIN DRAW
2 ROZET
3 ROZET SE
4 COYOTE DRAW
5 WHITETAIL CREEK NE
6 SADDLE HORSE BUTTE
7 WHITETAIL CREEK
8 WHITETAIL CREEK SE

INDEX TO ADJOINING 7.5 MAPS

COON TRACK CREEK, WYOMING
7.5 MINUTE SERIES
SHEET NUMBER 17 OF 72

105°07'30" 105°05'00" 105°02'30" 105°00'00"

(Joins sheet 9) R. 69 W. R. 68 W.

44°15'00" 44°15'00"

44°12'30" 44°12'30"

(Joins sheet 17)

T. 49 N. T. 49 N.
T. 48 N. T. 48 N.

44°10'00" 44°10'00"

44°07'30" 44°07'30"

(Joins sheet 27) R. 69 W. R. 68 W.

105°07'30" 105°05'00" 105°02'30" 105°00'00"

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North American Datum of 1927 (NAD27). Clarke 1866 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUADRANGLE LOCATION

SCALE 1:24000

KILOMETERS 1 0 1

FEET 1000 0 1000 2000 3000 4000 5000 6000 7000

MILES 1 0 1

1	2	3
4		5
6	7	8

1 ROZET
2 ROZET SE
3 MOORCROFT
4 COON TRACK CREEK
5 SPYGLASS HILL
6 WHITETAIL CREEK
7 WHITETAIL CREEK SE
8 CEDAR DRAW

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UNITED STATES
DEPARTMENT OF AGRICULTURE
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NORTH

QUADRANGLE LOCATION

SCALE 1:24000

KILOMETERS

FEET

MILES

1 JUNIPER DRAW
2 LASKIE DRAW
3 MORGAN DRAW
4 BOWMAN FLAT
5 BOGIE DRAW
6 HOE RANCH
7 THE NIPPLE
8 FATS DRAW

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UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

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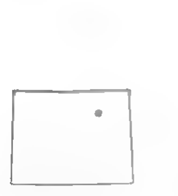
North American Datum of 1927 (NAD27). Clarke 1866 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH



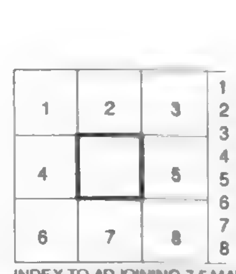
QUADRANGLE LOCATION

SCALE 1:24000

1 0 1
KILOMETERS

1000 0 1000 2000 3000 4000 5000 6000 7000
FEET

1 0 1
MILES



1 LASKIE DRAW
2 MORGAN DRAW
3 SCOTT DAM
4 NEGRO BUTTE
5 DOUBLE TANKS
6 THE NIPPLE
7 FATS DRAW
8 WAGS PINNACLE

INDEX TO ADJOINING 7.5 MAPS

BOGIE DRAW, WYOMING
7.5 MINUTE SERIES
SHEET NUMBER 20 OF 72

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

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North American Datum of 1927 (NAD27). Clarke 1866 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUADRANGLE LOCATION

SCALE 1:24000

1 0 1
KILOMETERS

1000 0 1000 2000 3000 4000 5000 6000 7000
FEET

1 0 1
MILES

1	2	3
4		5
6	7	8

1 MORGAN DRAW
2 SCOTT DAM
3 FOUR BAR J RANCH
4 BOGIE DRAW
5 PLEASANTDALE
6 FATS DRAW
7 WAGS PINNACLE
8 PERSSON DRAW

INDEX TO ADJOINING 7.5 MAPS

DOUBLE TANKS, WYOMING
7.5 MINUTE SERIES
SHEET NUMBER 21 OF 72

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

CAMPBELL COUNTY, WYOMING, SOUTHERN PART
PLEASANTDALE QUADRANGLE
SHEET NUMBER 22 OF 72

This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service, formerly Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey, from 1974 - 1979 aerial photography.

North American Datum of 1927 (NAD27). Clarke 1866 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUADRANGLE LOCATION

SCALE 1:24000

1 0 1
KILOMETERS

1000 0 1000 2000 3000 4000 5000 6000 7000
FEET

1 0 1
MILES

1	2	3
4		5
6	7	8

1 SCOTT DAM
2 FOUR BAR J RANCH
3 APPEL BUTTE
4 DOUBLE TANKS
5 SCAPER RESERVOIR
6 WAGS PINNACLE
7 PERSSON DRAW
8 THREEMILE CREEK RESERVOIR

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PLEASANTDALE, WYOMING
7.5 MINUTE SERIES
SHEET NUMBER 22 OF 72

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

CAMPBELL COUNTY, WYOMING, SOUTHERN PART
SCAPER RESERVOIR QUADRANGLE
SHEET NUMBER 23 OF 72

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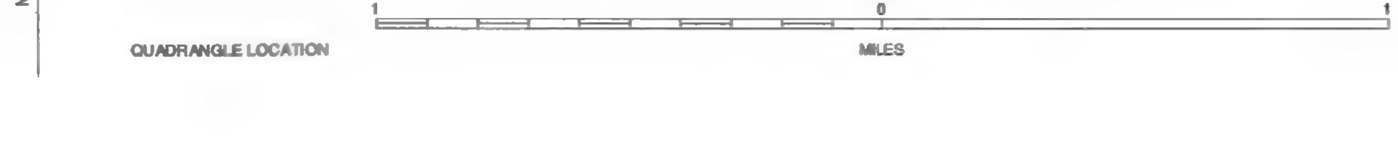
North American Datum of 1927 (NAD27). Clarke 1866 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.



1 FOUR BAR J RANCH
2 APPEL BUTTE
3 THE GAP
4 PLEASANTDALE
5 THE GAP SW
6 PERSSON DRAW
7 THREEMILE CREEK RESERVOIR
8 EAGLE ROCK

INDEX TO ADJOINING 7.5 MAPS

SCAPER RESERVOIR, WYOMING
7.5 MINUTE SERIES
SHEET NUMBER 23 OF 72

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

CAMPBELL COUNTY, WYOMING, SOUTHERN PART
THE GAP SW QUADRANGLE
SHEET NUMBER 24 OF 72

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North American Datum of 1927 (NAD27). Clarke 1866 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUADRANGLE LOCATION

SCALE 1:24000

KILOMETERS

FEET

MILES

1	2	3
4		5
6	7	8

1 APPEL BUTTE
2 THE GAP
3 COYOTE DRAW
4 SCAPER RESERVOIR
5 SADDLE HORSE BUTTE
6 THREEMILE CREEK RESERVOIR
7 EAGLE ROCK
8 NEIL BUTTE

INDEX TO ADJOINING 7.5 MAPS

THE GAP SW, WYOMING
7.5 MINUTE SERIES
SHEET NUMBER 24 OF 72

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

CAMPBELL COUNTY, WYOMING, SOUTHERN PART
SADDLE HORSE BUTTE QUADRANGLE
SHEET NUMBER 25 OF 72

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North American Datum of 1927 (NAD27). Clarke 1866 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUADRANGLE LOCATION

SCALE 1:24000

KILOMETERS

FEET

MILES

INDEX TO ADJOINING 7.5 MAPS

1 THE GAP
2 COYOTE DRAW
3 COON TRACK CREEK
4 THE GAP SW
5 WHITETAIL CREEK
6 EAGLE ROCK
7 NEIL BUTTE
8 ROUGH CREEK

SADDLE HORSE BUTTE, WYOMING
7.5 MINUTE SERIES
SHEET NUMBER 25 OF 72

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

CAMPBELL COUNTY, WYOMING, SOUTHERN PART
WHITETAIL CREEK QUADRANGLE
SHEET NUMBER 26 OF 72

This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service, formerly Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey, from 1974 - 1979 aerial photography.

North American Datum of 1927 (NAD27). Clarke 1866 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUADRANGLE LOCATION

SCALE 1:24000

KILOMETERS

FEET

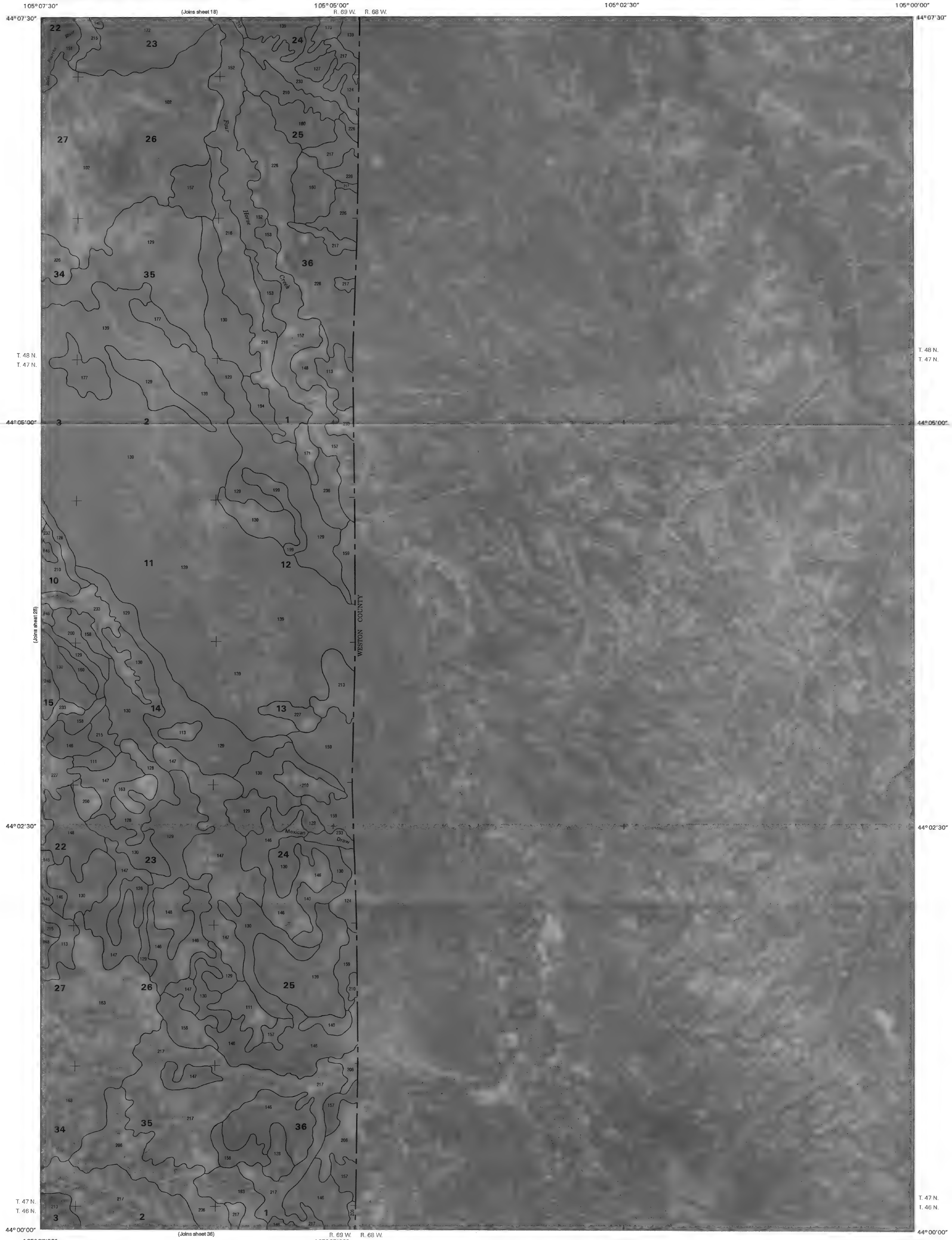
MILES

1	2	3
4		5
6	7	8

1 COYOTE DRAW
2 COON TRACK CREEK
3 WHITETAIL CREEK NE
4 SADDLE HORSE BUTTE
5 WHITETAIL CREEK SE
6 NEIL BUTTE
7 ROUGH CREEK
8 JIM CREEK

INDEX TO ADJOINING 7.5 MAPS

WHITETAIL CREEK, WYOMING
7.5 MINUTE SERIES
SHEET NUMBER 26 OF 72



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North American Datum of 1927 (NAD27). Clarke 1866 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUADRANGLE LOCATION

SCALE 1:24000

KILOMETERS

FEET

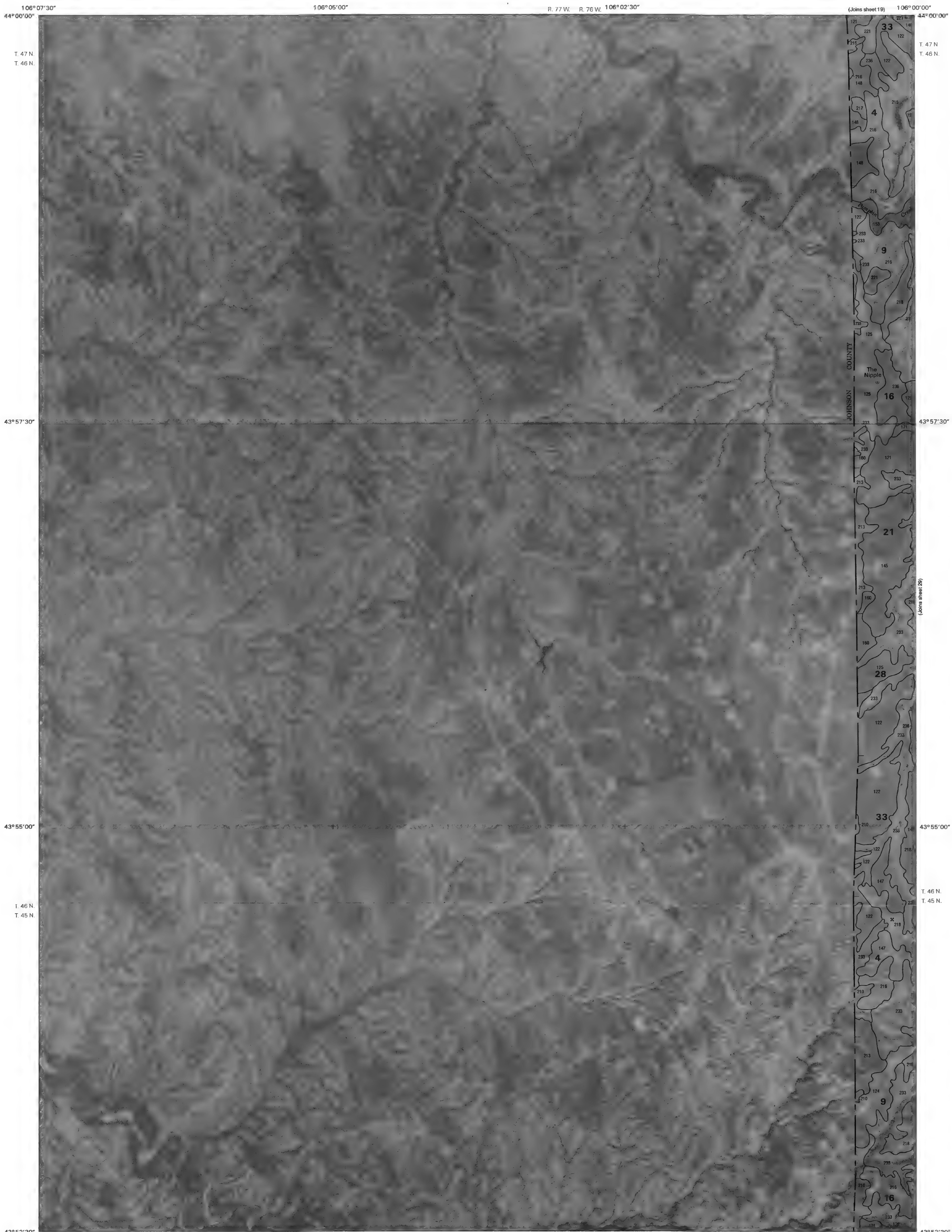
MILES

INDEX TO ADJOINING 7.5 MAPS

1 COON TRACK CREEK
2 WHITETAIL CREEK NE
3 SPYGLASS HILL
4 WHITETAIL CREEK
5 CEDAR DRAW
6 ROUGH CREEK
7 JIM CREEK
8 RAVEN

WHITETAIL CREEK SE, WYOMING
7.5 MINUTE SERIES
SHEET NUMBER 27 OF 72

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE



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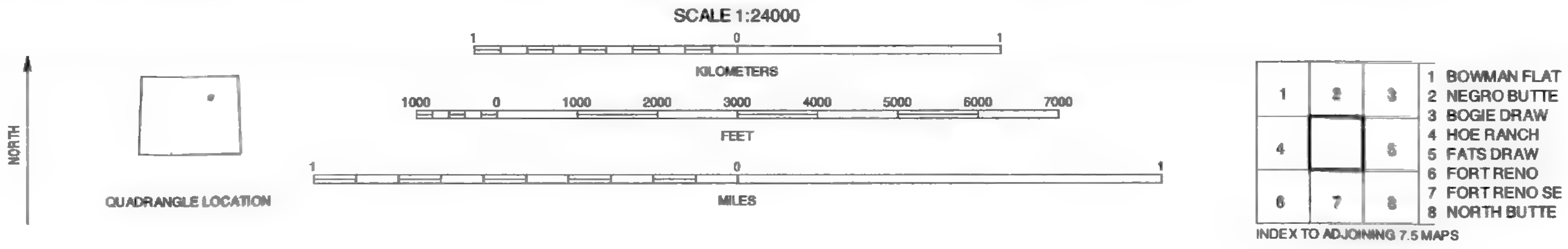
North American Datum of 1927 (NAD27). Clarke 1866 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.



THE NIPPLE, WYOMING
7.5 MINUTE SERIES
SHEET NUMBER 28 OF 72

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

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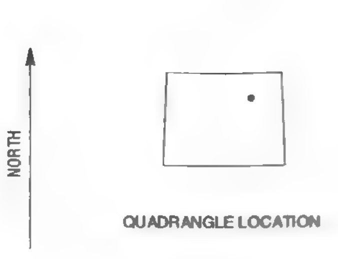
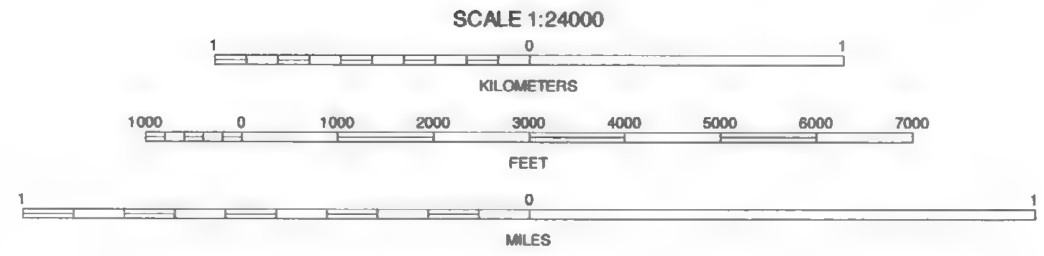
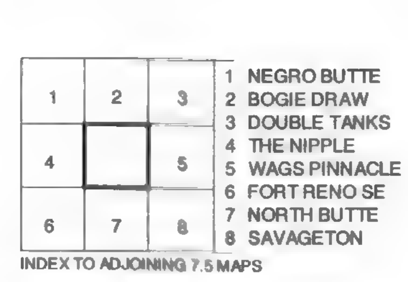
North American Datum of 1927 (NAD27). Clarke 1866 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.







FATS DRAW, WYOMING
7.5 MINUTE SERIES
SHEET NUMBER 29 OF 72

105°52'30" 105°50'00" (Joins sheet 21) R. 75 W. R. 74 W. 105°47'30" 105°45'00"

44°00'00" T. 47 N. T. 46 N. 44°00'00" T. 47 N. T. 46 N.

43°57'30" (Joins sheet 29) 43°57'30" (Joins sheet 31)

43°55'00" T. 46 N. T. 45 N. 43°55'00" T. 46 N. T. 45 N.

43°52'30" 43°52'30"

105°52'30" 105°50'00" (Joins sheet 39) R. 75 W. R. 74 W. 105°47'30" 105°45'00"

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North American Datum of 1927 (NAD27). Clarke 1866 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUADRANGLE LOCATION

SCALE 1:24000

1 0 1 KILOMETERS

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

1 0 1 MILES

1	2	3
4		5
6	7	8

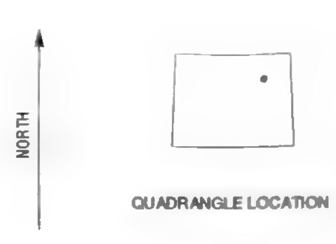
1 BOGIE DRAW
2 DOUBLE TANKS
3 PLEASANTDALE
4 FATS DRAW
5 PERSSON DRAW
6 NORTH BUTTE
7 SAVAGETON
8 GREASEWOOD RESERVOIR

INDEX TO ADJOINING 7.5 MAPS

WAGS PINNACLE, WYOMING
7.5 MINUTE SERIES
SHEET NUMBER 30 OF 72

This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service, formerly Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey, from 1974 - 1979 aerial photography.

North American Datum of 1927 (NAD27). Clarke 1866 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.



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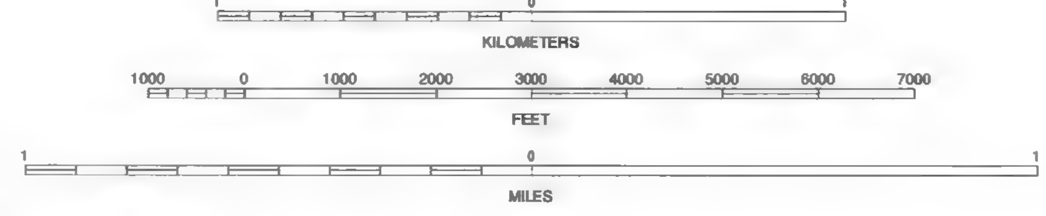
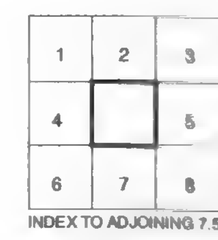




1 DOUBLE TANKS
2 PLEASANTDALE
3 SCAPER RESERVOIR
4 WAGS PINNACLE
5 THREEMILE CREEK RESERVOIR
6 SAVAGETON
7 GREASEWOOD RESERVOIR
8 ROCKY BUTTE GULCH

INDEX TO ADJOINING 7.5 MAPS

PERSSON DRAW, WYOMING
7.5 MINUTE SERIES
SHEET NUMBER 31 OF 72

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service, formerly Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey, from 1974 - 1979 aerial photography.

North American Datum of 1927 (NAD27). Clarke 1866 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUADRANGLE LOCATION

SCALE 1:24000

KILOMETERS

FEET

MILES

1	2	3
4		5
6	7	8

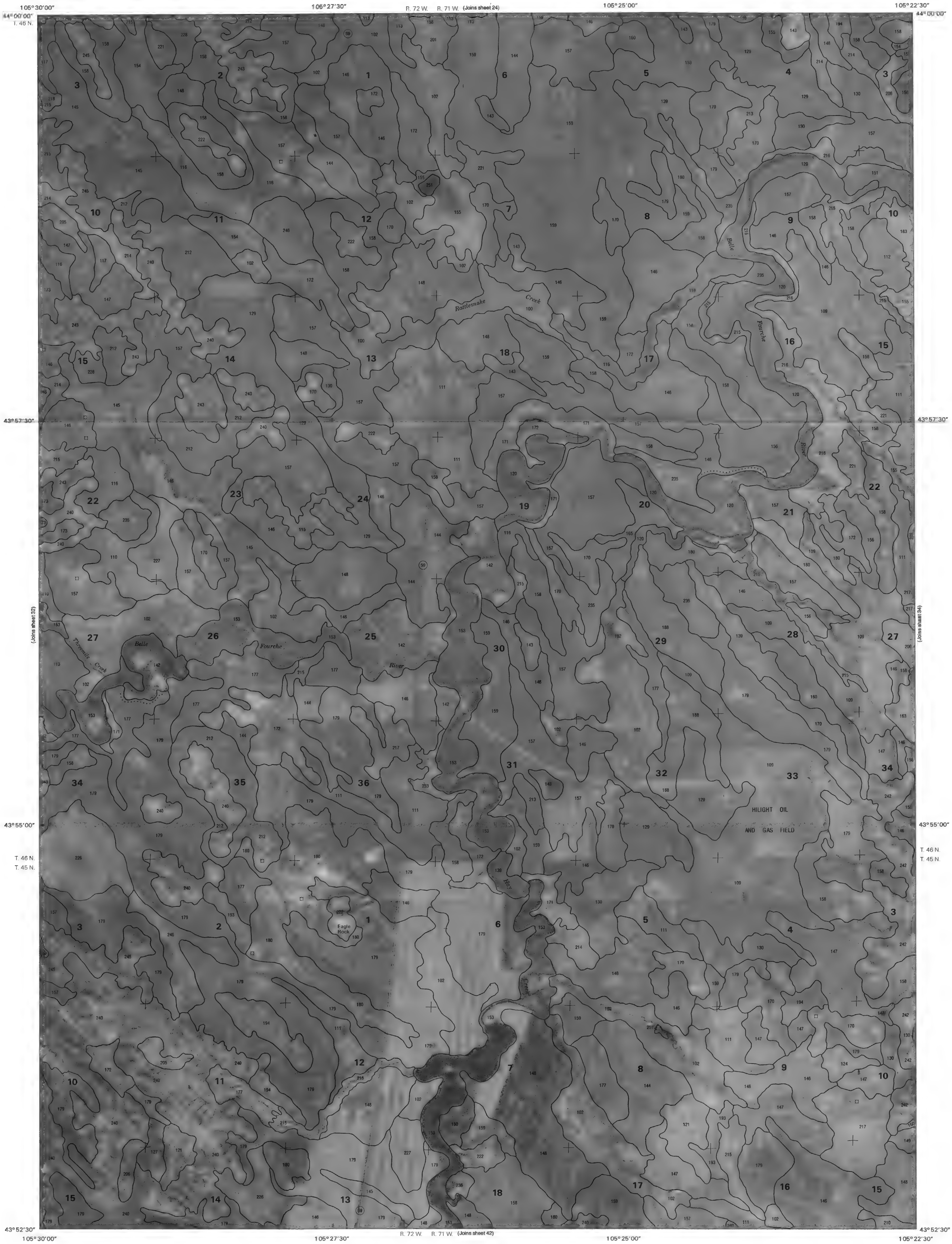
1 PLEASANTDALE
2 SCAPER RESERVOIR
3 THE GAP SW
4 PERSSON DRAW
5 EAGLE ROCK
6 GREASEWOOD RESERVOIR
7 ROCKY BUTTE GULCH
8 RENO JUNCTION

INDEX TO ADJOINING 7.5 MAPS

THREEMILE CREEK RESERVOIR, WYOMING
7.5 MINUTE SERIES
SHEET NUMBER 32 OF 72

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

CAMPBELL COUNTY, WYOMING, SOUTHERN PART
EAGLE ROCK QUADRANGLE
SHEET NUMBER 33 OF 72



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North American Datum of 1927 (NAD27). Clarke 1866 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUADRANGLE LOCATION

SCALE 1:24000

KILOMETERS

1000 0 1000 2000 3000 4000 5000 6000 7000

FEET

MILES

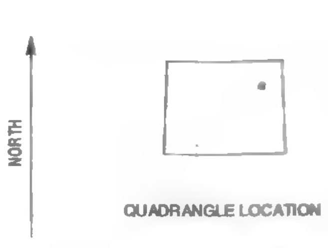
1 SCAPER RESERVOIR
2 THE GAP SW
3 SADDLE HORSE BUTTE
4 THREEMILE CREEK RESERVOIR
5 NEIL BUTTE
6 ROCKY BUTTE GULCH
7 RENO JUNCTION
8 HILIGHT

INDEX TO ADJOINING 7.5 MAPS

EAGLE ROCK, WYOMING
7.5 MINUTE SERIES
SHEET NUMBER 33 OF 72

This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service, formerly Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey, from 1974 - 1979 aerial photography.

North American Datum of 1927 (NAD27). Clarke 1866 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.



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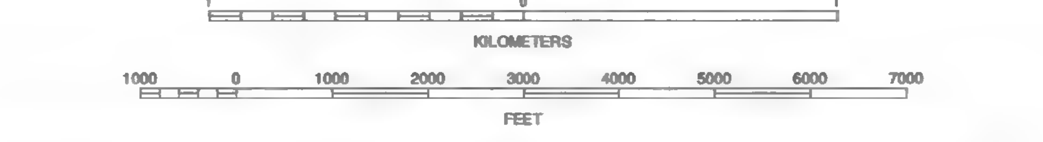

1	2	3
4		5
6	7	8

1 THE GAP SW
2 SADDLE HORSE BUTTE
3 WHITETAIL CREEK
4 EAGLE ROCK
5 ROUGH CREEK
6 RENO JUNCTION
7 HILIGHT
8 OPEN A RANCH

INDEX TO ADJOINING 7.5 MAPS

NEIL BUTTE, WYOMING
7.5 MINUTE SERIES
SHEET NUMBER 34 OF 72

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

CAMPBELL COUNTY, WYOMING, SOUTHERN PART
ROUGH CREEK QUADRANGLE
SHEET NUMBER 35 OF 72

105°15'00" 105°12'30" R. 70 W. R. 69 W. (Joins sheet 26) 105°10'00" 105°07'30"

44°00'00"

(Joins sheet 34) (Joins sheet 36)

43°57'30" 43°55'00" T. 46 N. T. 45 N. 43°52'30"

105°15'00" 105°12'30" R. 70 W. R. 69 W. (Joins sheet 44) 105°10'00" 105°07'30"

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North American Datum of 1927 (NAD27). Clarke 1866 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUADRANGLE LOCATION

SCALE 1:24000

1 0 1 KILOMETERS

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

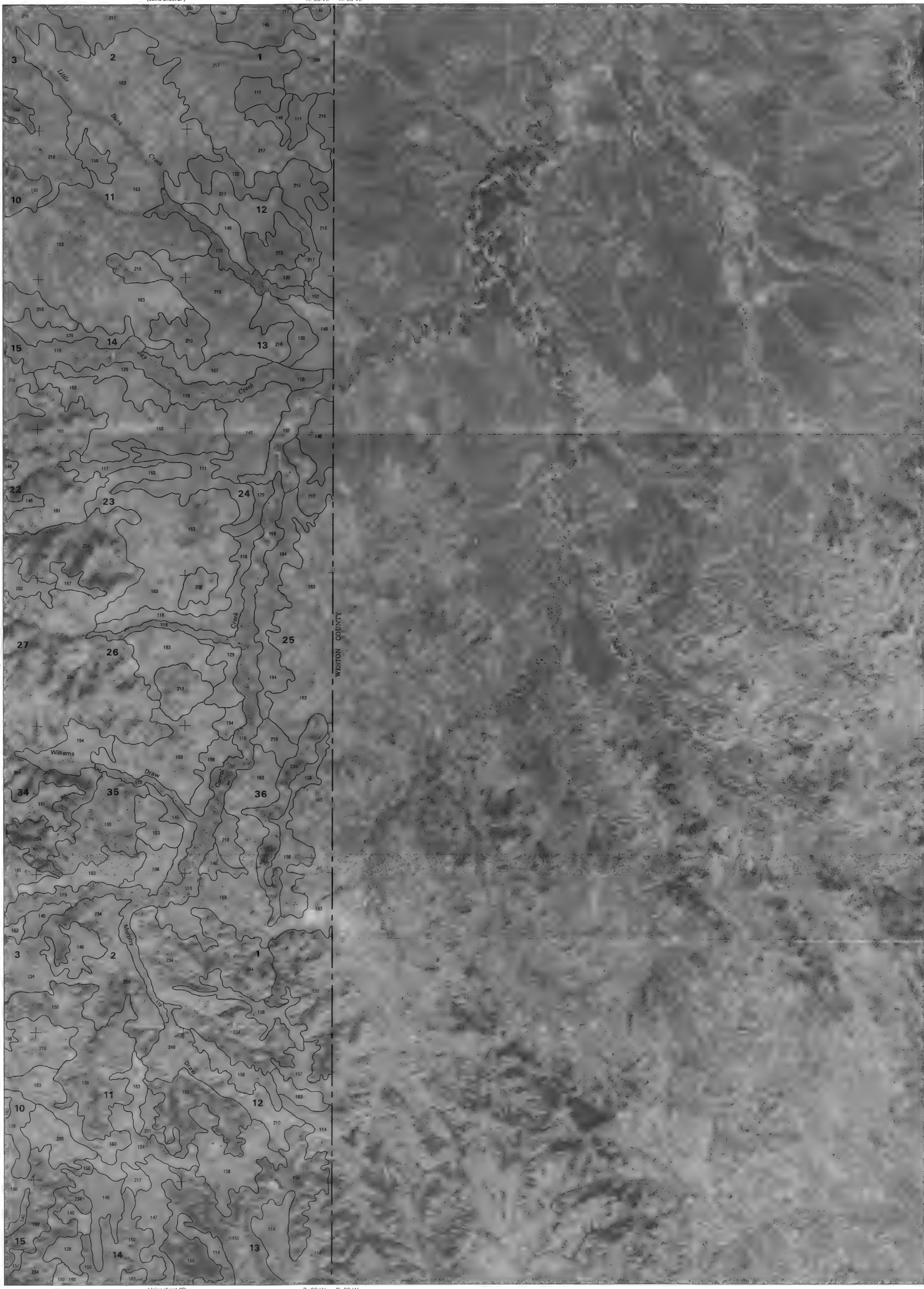
1 0 1 MILES

1	2	3
4		5
6	7	8

1 SADDLE HORSE BUTTE
2 WHITETAIL CREEK
3 WHITETAIL CREEK SE
4 NEIL BUTTE
5 JIM CREEK
6 HILIGHT
7 OPEN A RANCH
8 BUCK CREEK

INDEX TO ADJOINING 7.5 MAPS

ROUGH CREEK, WYOMING
7.5 MINUTE SERIES
SHEET NUMBER 35 OF 72



This soil survey was compiled by the U.S. Department of
Agriculture, Natural Resources Conservation Service, formerly
Soil Conservation Service, and cooperating agencies.
Base maps are orthophotographs prepared by the U.S.
Department of Interior, Geological Survey, from 1974 - 1979
aerial photography.

North American Datum of 1927 (NAD27). Clarke 1866 Spheroid
1000-meter ticks: Universal Transverse Mercator, zone 13.
Coordinate grid ticks and land division data, if shown, are
approximately positioned. Digital data are available for
this quadrangle.

NORTH

QUADRANGLE LOCATION

SCALE 1:24000

1 0 1
KILOMETERS

1000 0 1000 2000 3000 4000 5000 6000 7000
FEET

1 0 1
MILES

1 WHITETAIL CREEK
2 WHITETAIL CREEK SE
3 CEDAR DRAW
4 ROUGH CREEK
5 RAVEN
6 OPEN A RANCH
7 BUCK CREEK
8 WILDLIFE DRAW WEST

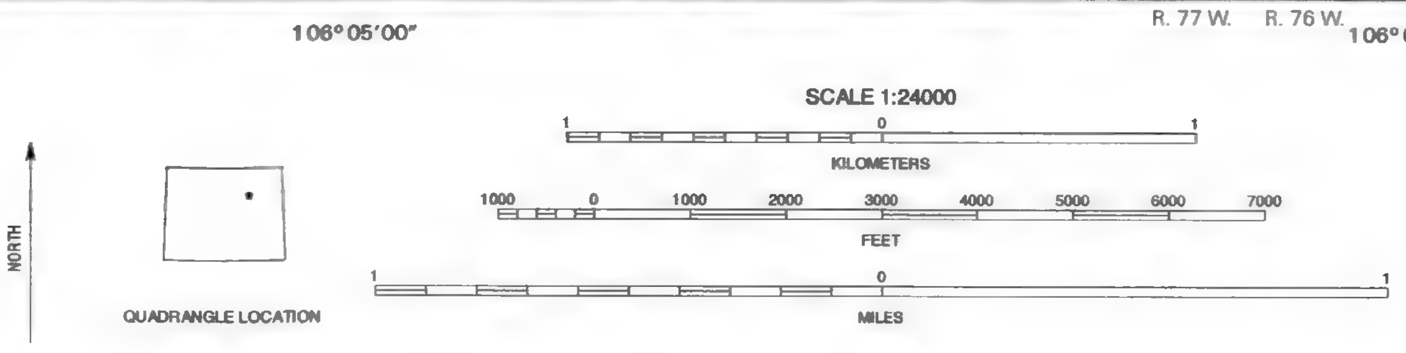
INDEX TO ADJOINING 7.5 MAPS

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

CAMPBELL COUNTY, WYOMING, SOUTHERN PART
FORT RENO SE QUADRANGLE
SHEET NUMBER 37 OF 72

This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service, formerly Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey, from 1974 - 1979 aerial photography.

North American Datum of 1927 (NAD27). Clarke 1866 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.



1	2	3
4		5
6	7	8

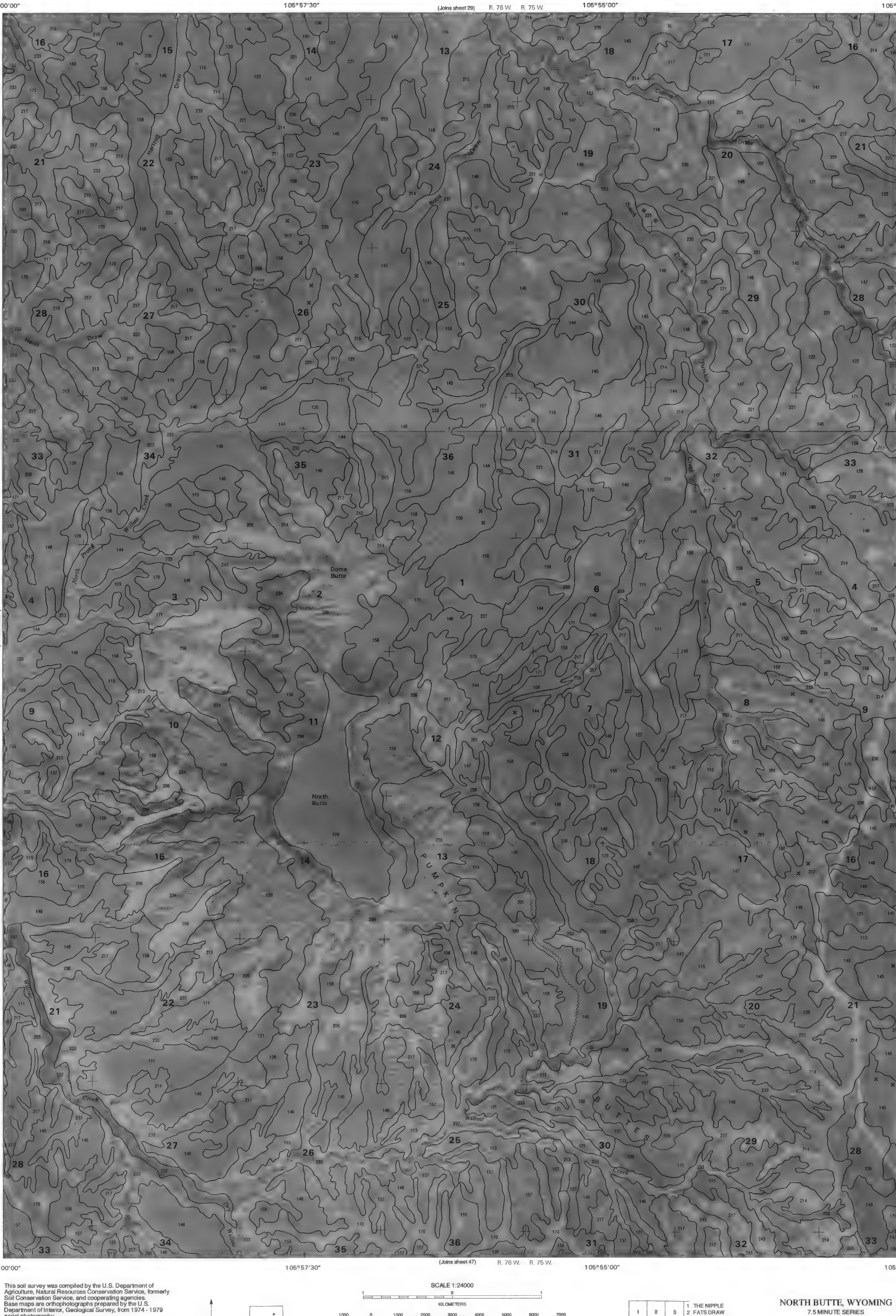
1 HOE RANCH
2 THE NIPPLE
3 FATS DRAW
4 FORT RENO
5 NORTH BUTTE
6 HOUSE CREEK
7 DRY FORK RANCH
8 ROLLING PIN RANCH

INDEX TO ADJOINING 7.5 MAPS

FORT RENO SE, WYOMING
7.5 MINUTE SERIES
SHEET NUMBER 37 OF 72

106°00'00" 105°57'30" (Joins sheet 29) R. 76 W. R. 75 W. 105°55'00" 105°52'30"

43°52'30" 43°52'30"



43°45'00" 43°45'00"

106°00'00" 105°57'30" (Joins sheet 47) R. 76 W. R. 75 W. 105°55'00" 105°52'30"

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North American Datum of 1927 (NAD27). Clarke 1866 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUADRANGLE LOCATION

SCALE 1:24000

1	2	3
4		5
6	7	8

1 THE NIPPLE
2 FATS DRAW
3 WAGS PINNACLE
4 FORT RENO SE
5 SAVAGETON
6 DRY FORK RANCH
7 ROLLING PIN RANCH
8 SOUTH BUTTE

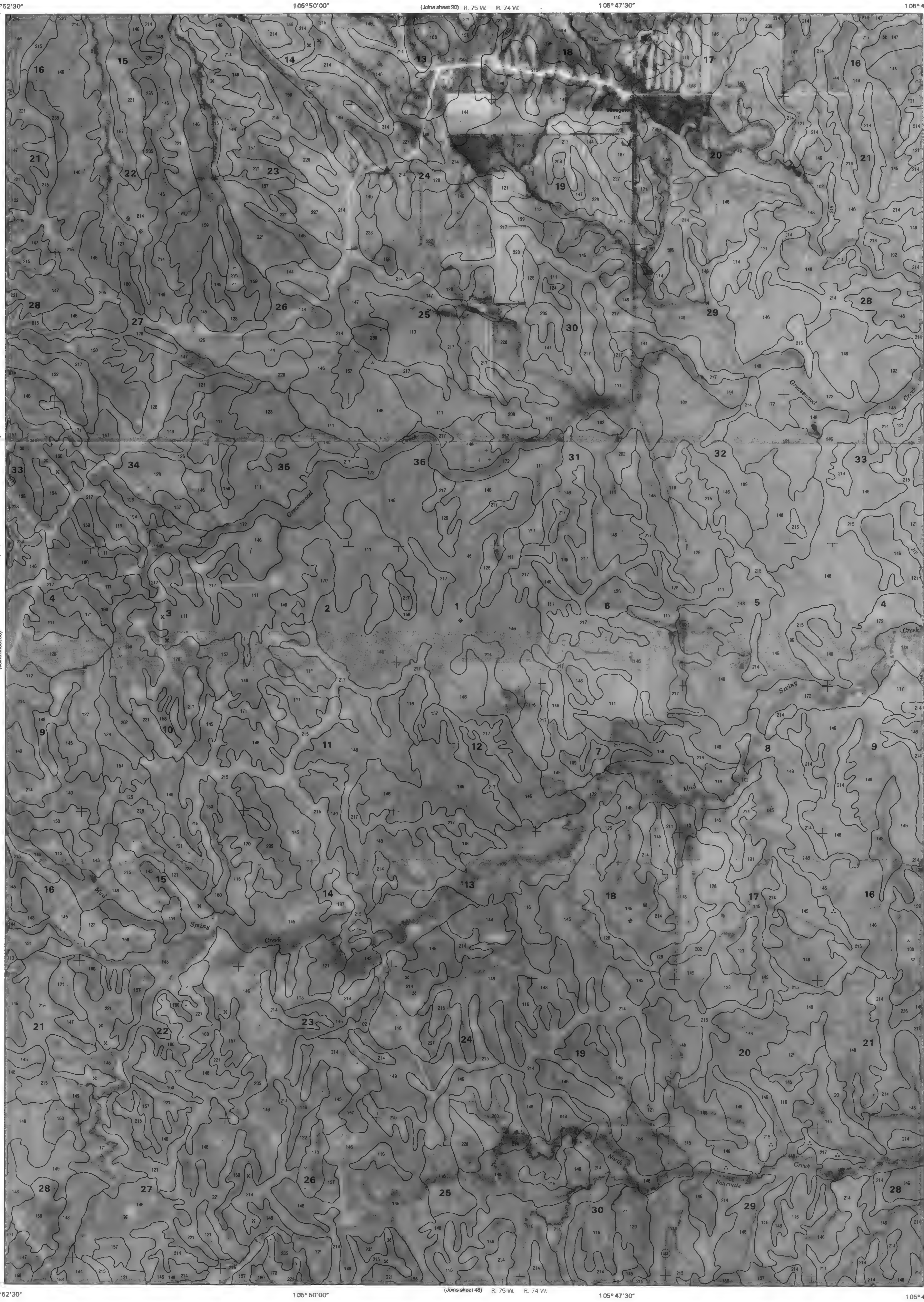
INDEX TO ADJOINING 7.5 MAPS

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

CAMPBELL COUNTY, WYOMING, SOUTHERN PART
SAVAGETON QUADRANGLE
SHEET NUMBER 39 OF 72

105°52'30" | 105°50'00" | (Joins sheet 30) R. 75 W. R. 74 W. | 105°47'30" | 105°45'00"

43°52'30"



43°50'00" | 43°47'30" | 43°45'00"

105°52'30" | 105°50'00" | (Joins sheet 48) R. 75 W. R. 74 W. | 105°47'30" | 105°45'00"

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North American Datum of 1927 (NAD27). Clarke 1866 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUADRANGLE LOCATION

SCALE 1:24000

KILOMETERS

FEET

MILES

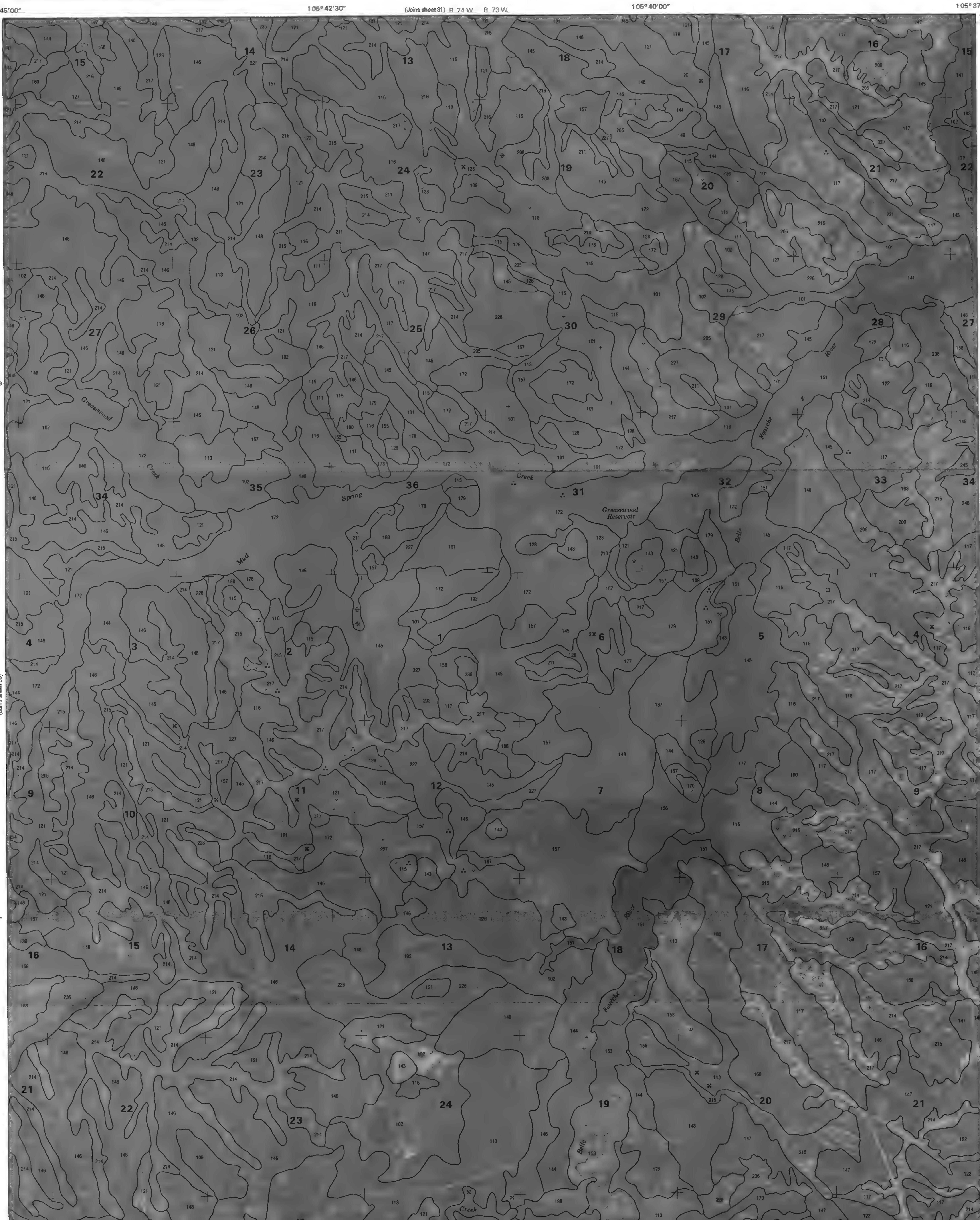
1	2	3
4		5
6	7	8

1 FATS DRAW
2 WAGS PINNACLE
3 PERSSON DRAW
4 NORTH BUTTE
5 GREASEWOOD RESERVOIR
6 ROLLING PIN RANCH
7 SOUTH BUTTE
8 BAKER SPRING

INDEX TO ADJOINING 7.5 MAPS

SAVAGETON, WYOMING
7.5 MINUTE SERIES
SHEET NUMBER 39 OF 72

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE



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North American Datum of 1927 (NAD27). Clarke 1866 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUADRANGLE LOCATION

SCALE 1:24000

1 0 1
KILOMETERS

1000 0 1000 2000 3000 4000 5000 6000 7000
FEET

1 0 1
MILES

1	2	3
4		5
6	7	8

1 WAGS PINNACLE
2 PERSSON DRAW
3 THREEMILE CREEK RESERVOIR
4 SAVAGETON
5 ROCKY BUTTE GULCH
6 SOUTH BUTTE
7 BAKER SPRING
8 RATTLESNAKE DRAW

INDEX TO ADJOINING 7.5 MAPS

GREASEWOOD RESERVOIR, WYOMING
7.5 MINUTE SERIES
SHEET NUMBER 40 OF 72

This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service, formerly Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey, from 1974 - 1979 aerial photography.

North American Datum of 1927 (NAD27). Clarke 1866 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUADRANGLE LOCATION

SCALE 1:24000

1 0 1
KILOMETERS

1000 0 1000 2000 3000 4000 5000 6000 7000
FEET

1 0 1
MILES

1	2	3
4		5
6	7	8

1 PERSSON DRAW
2 THREEMILE CREEK RESERVOIR
3 EAGLE ROCK
4 GREASEWOOD RESERVOIR
5 RENO JUNCTION
6 BAKER SPRING
7 RATTLESNAKE DRAW
8 LITTLE THUNDER RESERVOIR

INDEX TO ADJOINING 7.5 MAPS

ROCKY BUTTE GULCH, WYOMING
7.5 MINUTE SERIES
SHEET NUMBER 41 OF 72

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

CAMPBELL COUNTY, WYOMING, SOUTHERN PART
RENO JUNCTION QUADRANGLE
SHEET NUMBER 42 OF 72

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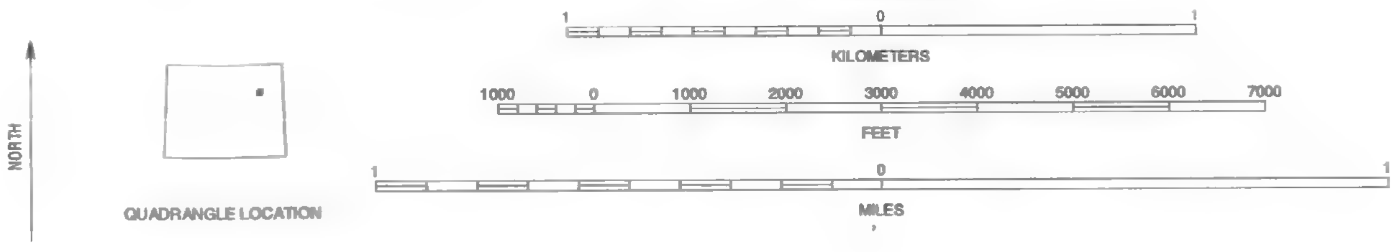
North American Datum of 1927 (NAD27). Clarke 1866 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.



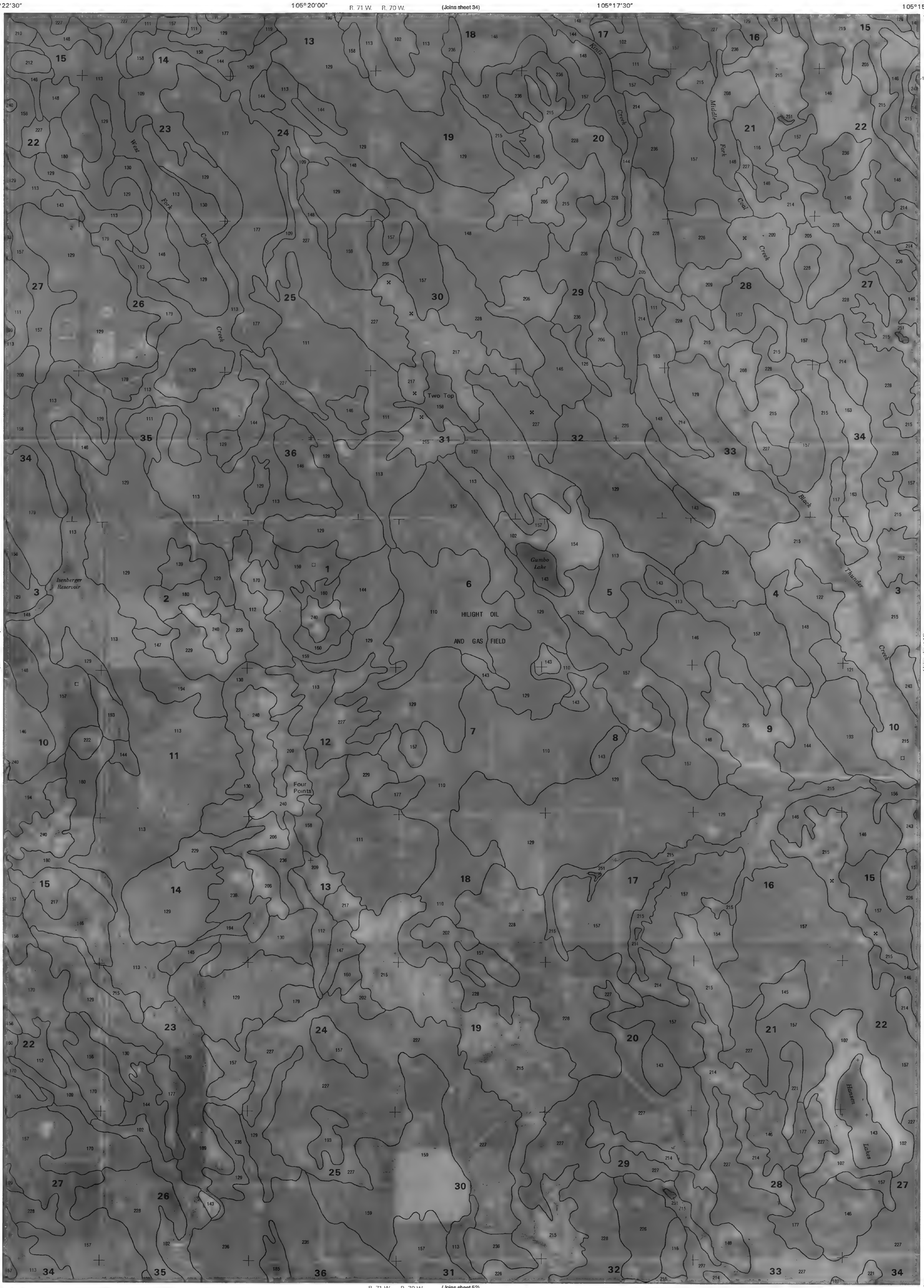
1	2	3
4		5
6	7	8

1 THREEMILE CREEK RESERVOIR
2 EAGLE ROCK
3 NEIL BUTTE
4 ROCKY BUTTE GULCH
5 HILIGHT
6 RATTLESNAKE DRAW
7 LITTLE THUNDER RESERVOIR
8 RENO RESERVOIR

INDEX TO ADJOINING 7.5 MAPS

RENO JUNCTION, WYOMING
7.5 MINUTE SERIES
SHEET NUMBER 42 OF 72

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE



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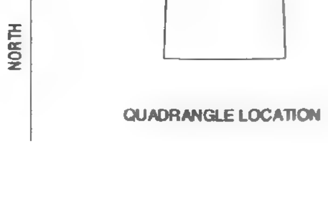
North American Datum of 1927 (NAD27). Clarke 1866 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.



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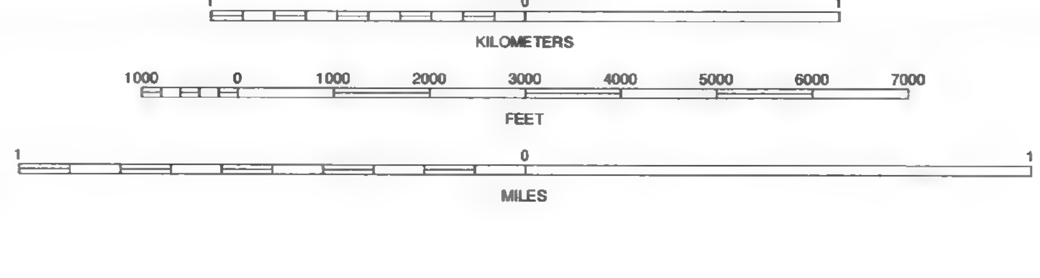

1	2	3
4		5
6	7	8

1 EAGLE ROCK
2 NEIL BUTTE
3 ROUGH CREEK
4 RENO JUNCTION
5 OPEN A RANCH
6 LITTLE THUNDER RESERVOIR
7 RENO RESERVOIR
8 PINEY CANYON NW

INDEX TO ADJOINING 7.5 MAPS

HILIGHT, WYOMING
7.5 MINUTE SERIES
SHEET NUMBER 43 OF 72

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

CAMPBELL COUNTY, WYOMING, SOUTHERN PART
OPEN A RANCH QUADRANGLE
SHEET NUMBER 44 OF 72

This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service, formerly Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey, from 1974 - 1979 aerial photography.

North American Datum of 1927 (NAD27). Clarke 1866 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUADRANGLE LOCATION

SCALE 1:24000

1 0 1
KILOMETERS

1000 0 1000 2000 3000 4000 5000 6000 7000
FEET

1 0 1
MILES

1	2	3
4		5
6	7	8

1 NEIL BUTTE
2 ROUGH CREEK
3 JIM CREEK
4 HILIGHT
5 BUCK CREEK
6 RENO RESERVOIR
7 PINEY CANYON NW
8 PINEY CANYON NE

INDEX TO ADJOINING 7.5 MAPS

OPEN A RANCH, WYOMING
7.5 MINUTE SERIES
SHEET NUMBER 44 OF 72

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

CAMPBELL COUNTY, WYOMING, SOUTHERN PART
BUCK CREEK QUADRANGLE
SHEET NUMBER 45 OF 72

This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service, formerly Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey, from 1974 - 1979 aerial photography.

North American Datum of 1927 (NAD27). Clarke 1866 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUADRANGLE LOCATION

SCALE 1:24000

KILOMETERS

FEET

MILES

1 ROUGH CREEK
2 JIM CREEK
3 RAVEN
4 OPEN A RANCH
5 WILDLIFE DRAW WEST
6 PINEY CANYON NW
7 PINEY CANYON NE
8 DARLINGTON DRAW WEST

INDEX TO ADJOINING 7.5 MAPS

BUCK CREEK, WYOMING
7.5 MINUTE SERIES
SHEET NUMBER 45 OF 72

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

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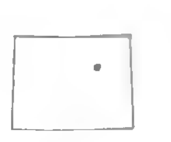
North American Datum of 1927 (NAD27). Clarke 1866 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH



QUADRANGLE LOCATION

SCALE 1:24000

1 0 1
KILOMETERS

1000 0 1000 2000 3000 4000 5000 6000 7000
FEET

1 0 1
MILES

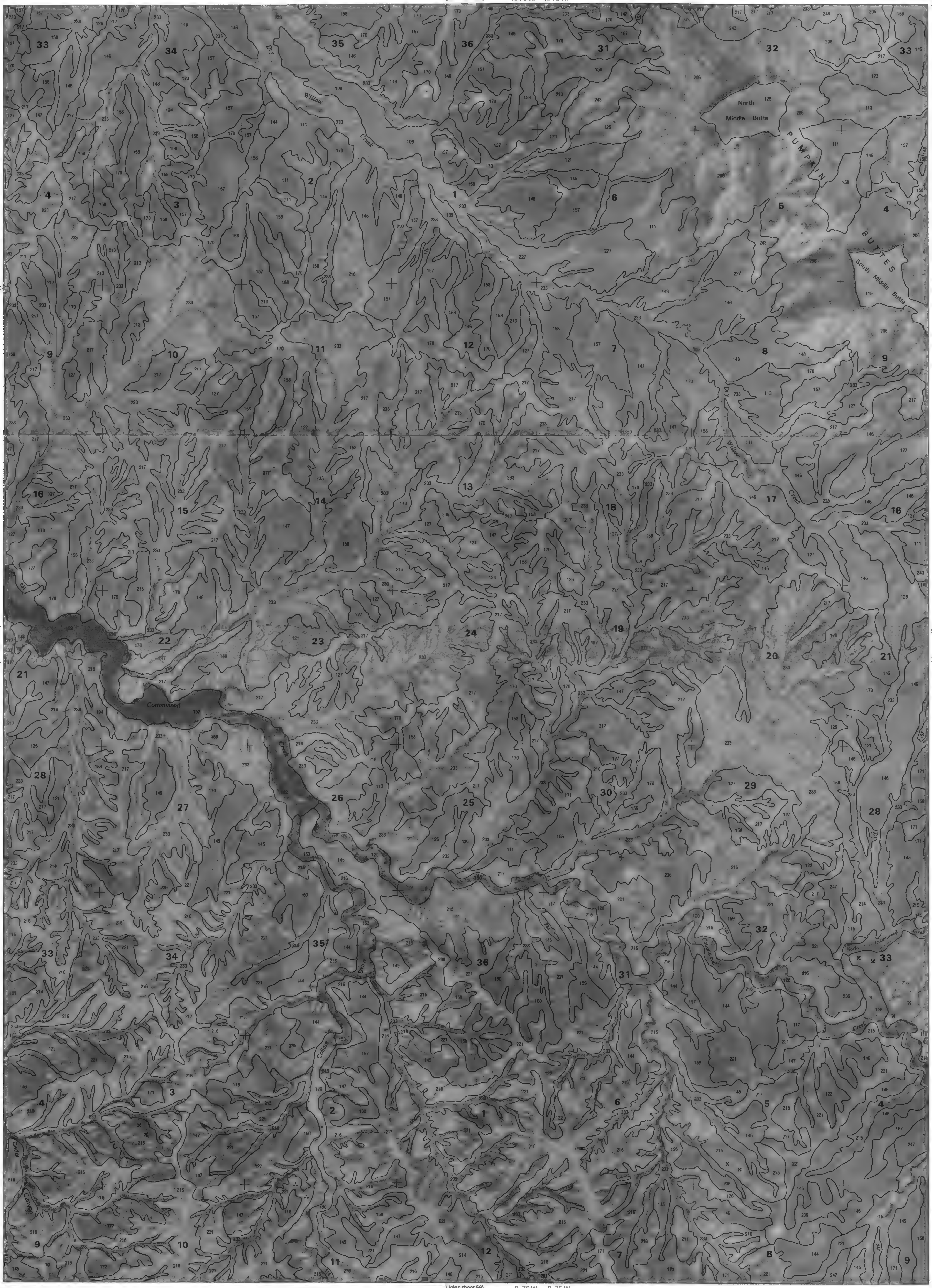
1	2	3
4		5
6	7	8

1 FORT RENO
2 FORT RENO SE
3 NORTH BUTTE
4 HOUSE CREEK
5 ROLLING PIN RANCH
6 LINCH
7 TAYLOR RANCH
8 ARTESIAN DRAW

INDEX TO ADJOINING 7.5 MAPS

DRY FORK RANCH, WYOMING
7.5 MINUTE SERIES
SHEET NUMBER 46 OF 72

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE



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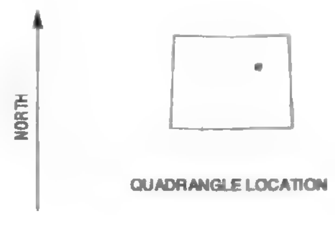
North American Datum of 1927 (NAD27). Clarke 1866 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.



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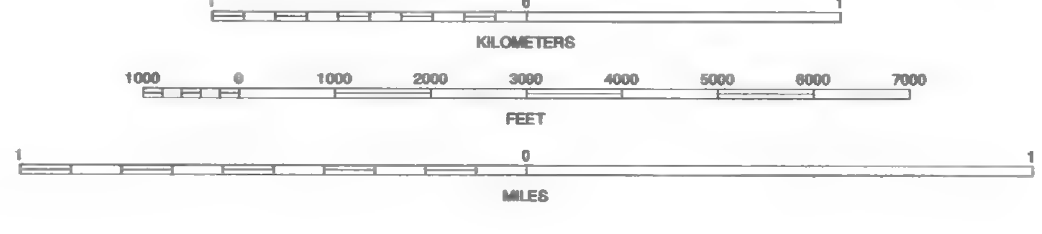

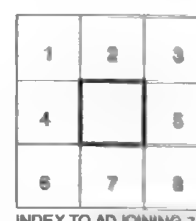

1 FORT RENO SE
2 NORTH BUTTE
3 SAVAGETON
4 DRY FORK RANCH
5 SOUTH BUTTE
6 TAYLOR RANCH
7 ARTESIAN DRAW
8 PINE TREE

INDEX TO ADJOINING 7.5 MAPS

ROLLING PIN RANCH, WYOMING
7.5 MINUTE SERIES
SHEET NUMBER 47 OF 72

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

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North American Datum of 1927 (NAD27). Clarke 1866 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUADRANGLE LOCATION

SCALE 1:24000

KILOMETERS

FEET

MILES

1	2	3
4		5
6	7	8

1 NORTH BUTTE
2 SAVAGETON
3 GREASEWOOD RESERVOIR
4 ROLLING PIN RANCH
5 BAKER SPRING
6 ARTESIAN DRAW
7 PINE TREE
8 TURNERCREST

INDEX TO ADJOINING 7.5 MAPS

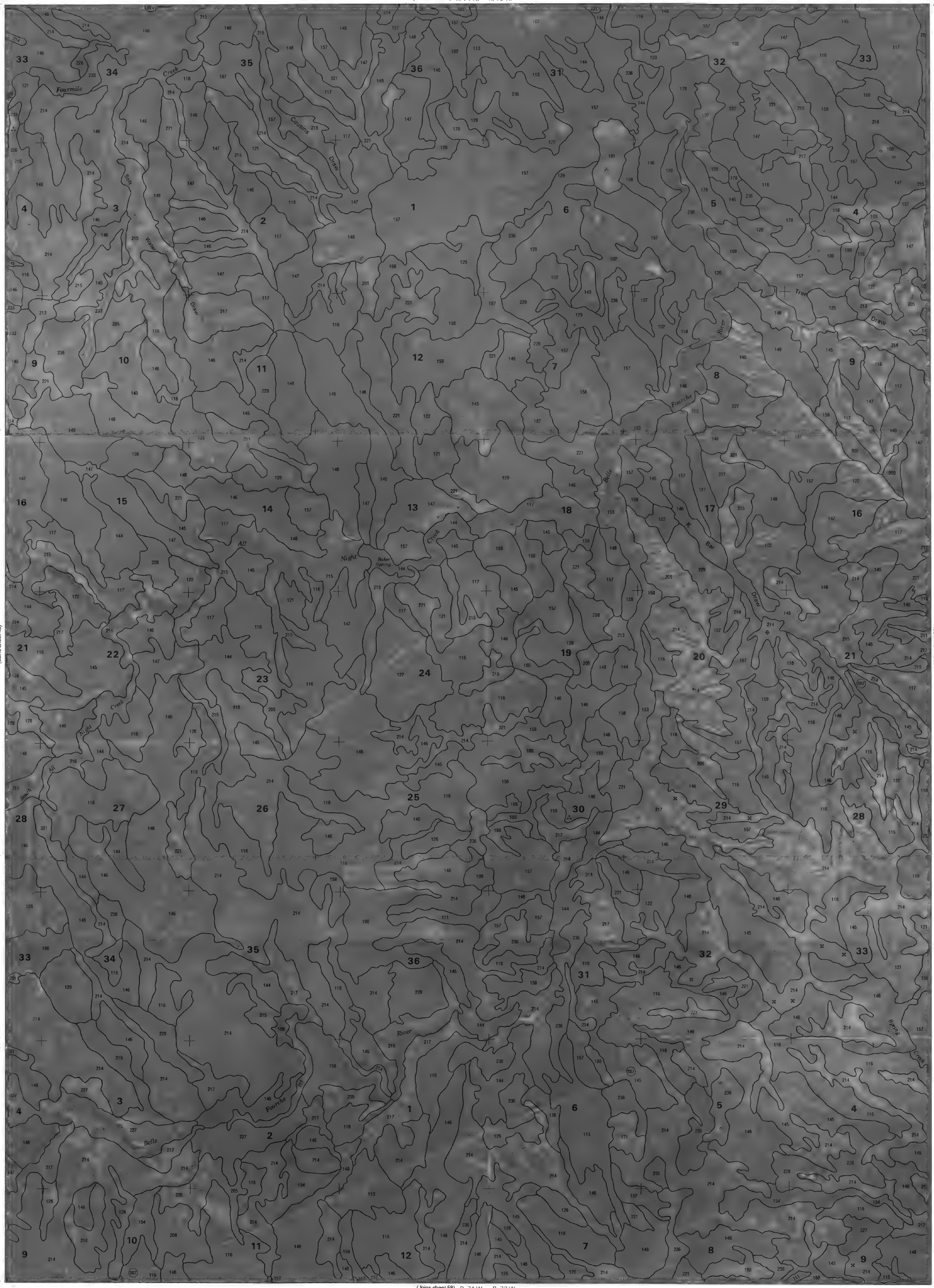
SOUTH BUTTE, WYOMING
7.5 MINUTE SERIES
SHEET NUMBER 48 OF 72

105° 45'00" | 105° 42'30" | (Joins sheet 40) R. 74 W. R. 73 W. | 105° 40'00" | 105° 37'30"

43° 45'00" | 43° 42'30" | 43° 40'00" | 43° 37'30"

T. 44 N. / T. 43 N. — T. 43 N. / T. 42 N.

(Joins sheet 48) — (Joins sheet 50)



(Joins sheet 58) R. 74 W. R. 73 W.

105° 45'00" | 105° 42'30" | 105° 40'00" | 105° 37'30"

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Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey, from 1974 - 1979 aerial photography.

North American Datum of 1927 (NAD27). Clarke 1866 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUADRANGLE LOCATION

SCALE 1:24000

1 0 1
KILOMETERS

1000 0 1000 2000 3000 4000 5000 6000 7000
FEET

1 0 1
MILES

1	2	3
4		5
6	7	8

1 SAVAGETON
2 GREASEWOOD RESERVOIR
3 ROCKY BUTTE GULCH
4 SOUTH BUTTE
5 RATTLESNAKE DRAW
6 PINE TREE
7 TURNERCREST
8 RENO FLATS

INDEX TO ADJOINING 7.5 MAPS

BAKER SPRING, WYOMING
7.5 MINUTE SERIES
SHEET NUMBER 49 OF 72

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

CAMPBELL COUNTY, WYOMING, SOUTHERN PART
RATTLESNAKE DRAW QUADRANGLE
SHEET NUMBER 50 OF 72

This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service, formerly Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey, from 1974 - 1979 aerial photography.

North American Datum of 1927 (NAD27). Clarke 1866 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUADRANGLE LOCATION

SCALE 1:24000

KILOMETERS

FEET

MILES

1	2	3
4		5
6	7	8

1 GREASEWOOD RESERVOIR
2 ROCKY BUTTE GULCH
3 RENO JUNCTION
4 BAKER SPRING
5 LITTLE THUNDER RESERVOIR
6 TURNERCREST
7 RENO FLATS
8 TECKLA SW

INDEX TO ADJOINING 7.5 MAPS

RATTLESNAKE DRAW, WYOMING
7.5 MINUTE SERIES
SHEET NUMBER 50 OF 72

This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service, formerly Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey, from 1974 - 1979 aerial photography.

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NORTH

QUADRANGLE LOCATION

SCALE 1:24000

KILOMETERS

FEET

MILES

1	2	3
4		5
6	7	8

1 ROCKY BUTTE GULCH
2 RENO JUNCTION
3 HILIGHT
4 RATTLESNAKE DRAW
5 RENO RESERVOIR
6 RENO FLATS
7 TECKLA SW
8 TECKLA

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UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

CAMPBELL COUNTY, WYOMING, SOUTHERN PART
RENO RESERVOIR QUADRANGLE
SHEET NUMBER 52 OF 72

This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service, formerly Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey, from 1974 - 1979 aerial photography.

North American Datum of 1927 (NAD27). Clarke 1866 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUADRANGLE LOCATION

SCALE 1:24000

KILOMETERS

FEET

MILES

INDEX TO ADJOINING 7.5 MAPS

1 RENO JUNCTION
2 HILIGHT
3 OPEN A RANCH
4 LITTLE THUNDER RESERVOIR
5 PINEY CANYON NW
6 TECKLA SW
7 TECKLA
8 PINEY CANYON SW

RENO RESERVOIR, WYOMING
7.5 MINUTE SERIES
SHEET NUMBER 52 OF 72

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

CAMPBELL COUNTY, WYOMING, SOUTHERN PART
PINEY CANYON NW QUADRANGLE
SHEET NUMBER 53 OF 72

This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service, formerly Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey, from 1974 - 1979 aerial photography.

North American Datum of 1927 (NAD27). Clarke 1866 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUADRANGLE LOCATION

SCALE 1:24000

KILOMETERS

FEET

MILES

1	2	3
4		5
6	7	8

1 HILIGHT
2 OPEN A RANCH
3 BUCK CREEK
4 RENO RESERVOIR
5 PINEY CANYON NE
6 TECKLA
7 PINEY CANYON SW
8 PINEY CANYON SE

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PINEY CANYON NW, WYOMING
7.5 MINUTE SERIES
SHEET NUMBER 53 OF 72

UNITED STATES
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NORTH

QUADRANGLE LOCATION

SCALE 1:24000

KILOMETERS

FEET

MILES

1 OPEN A RANCH
2 BUCK CREEK
3 WILDLIFE DRAW WEST
4 PINEY CANYON NW
5 DARLINGTON DRAW WEST
6 PINEY CANYON SW
7 PINEY CANYON SE
8 LION CREEK

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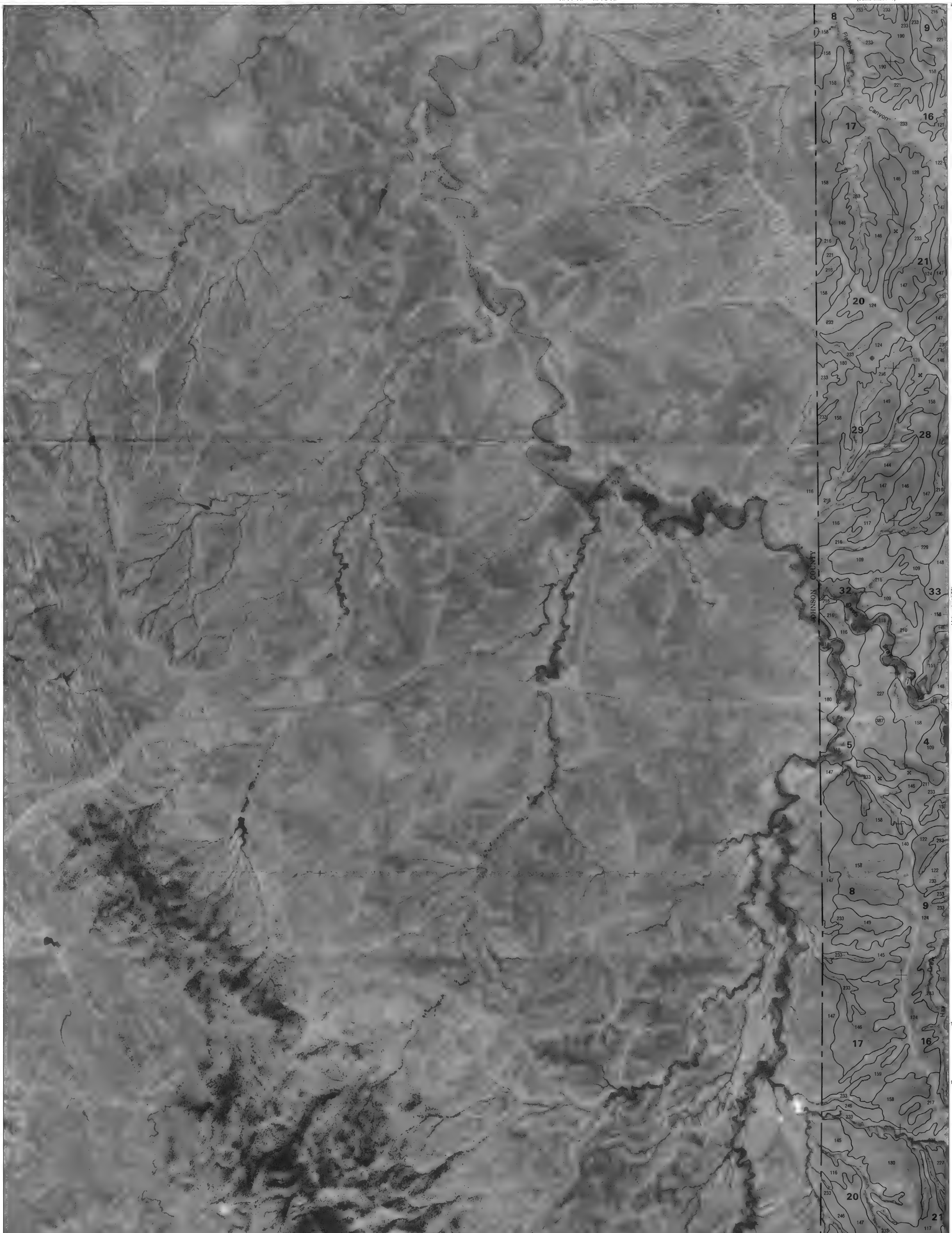
PINEY CANYON NE, WYOMING
7.5 MINUTE SERIES
SHEET NUMBER 54 OF 72

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

CAMPBELL COUNTY, WYOMING, SOUTHERN PART
TAYLOR RANCH QUADRANGLE
SHEET NUMBER 55 OF 72



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NORTH

QUADRANGLE LOCATION

SCALE 1:24000

KILOMETERS

FEET

MILES

1	2	3
4		5
6	7	8

1 HOUSE CREEK
2 DRY FORK RANCH
3 ROLLING PIN RANCH
4 LINCH
5 ARTESIAN DRAW
6 EDGERTON
7 SAWMILL CANYON
8 ROSS

INDEX TO ADJOINING 7.5 MAPS

TAYLOR RANCH, WYOMING
7.5 MINUTE SERIES
SHEET NUMBER 55 OF 72

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North American Datum of 1927 (NAD27). Clarke 1866 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUADRANGLE LOCATION

SCALE 1:24000

1 0 1 KILOMETERS

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

1 0 1 MILES

1	2	3
4		5
6	7	8

1 DRY FORK RANCH
2 ROLLING PIN RANCH
3 SOUTH BUTTE
4 TAYLOR RANCH
5 PINE TREE
6 SAWMILL CANYON
7 ROSS
8 ROSS FLAT

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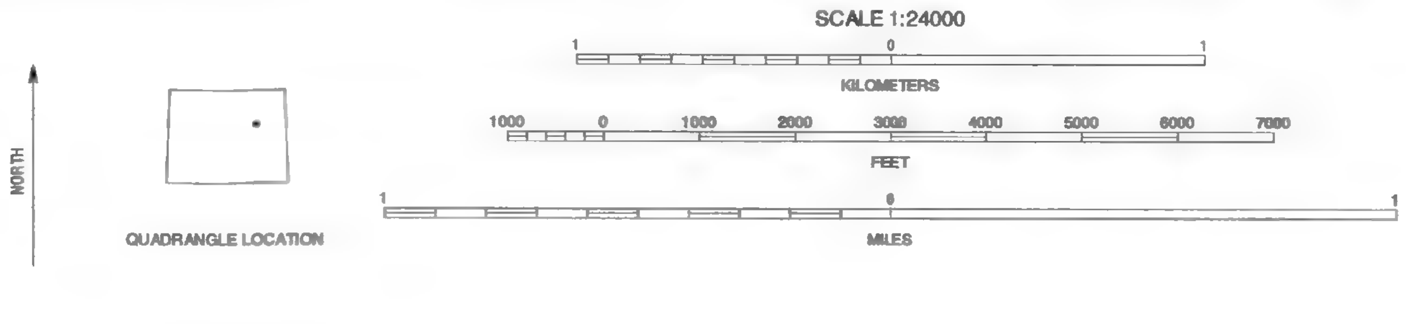
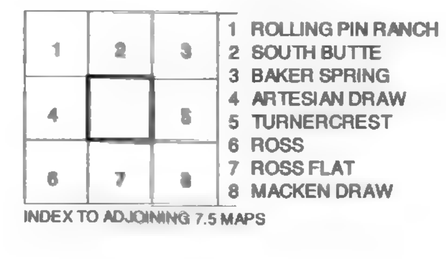
North American Datum of 1927 (NAD27). Clarke 1866 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.





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North American Datum of 1927 (NAD27). Clarke 1866 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUADRANGLE LOCATION

SCALE 1:24000

KILOMETERS

FEET

MILES

1	2	3
4		5
6	7	8

1 SOUTH BUTTE
2 BAKER SPRING
3 RATTLESNAKE DRAW
4 PINE TREE
5 RENO FLATS
6 ROSS FLAT
7 MACKEN DRAW
8 COAL DRAW NORTH

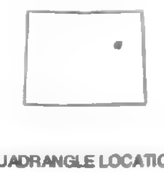
INDEX TO ADJOINING 7.5 MAPS

TURNERCREST, WYOMING
7.5 MINUTE SERIES
SHEET NUMBER 58 OF 72

This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service, formerly Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey, from 1974 - 1979 aerial photography.

North American Datum of 1927 (NAD27). Clarke 1866 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH



QUADRANGLE LOCATION

SCALE 1:24000

1 0 1
KILOMETERS

1000 0 1000 2000 3000 4000 5000 6000 7000
FEET

1 0 1
MILES

1	2	3
4		5
6	7	8

1 BAKER SPRING
2 RATTLESNAKE DRAW
3 LITTLE THUNDER RESERVOIR
4 TURNERCREST
5 TECKLA SW
6 MACKEN DRAW
7 COAL DRAW NORTH
8 BETTY RESERVOIR

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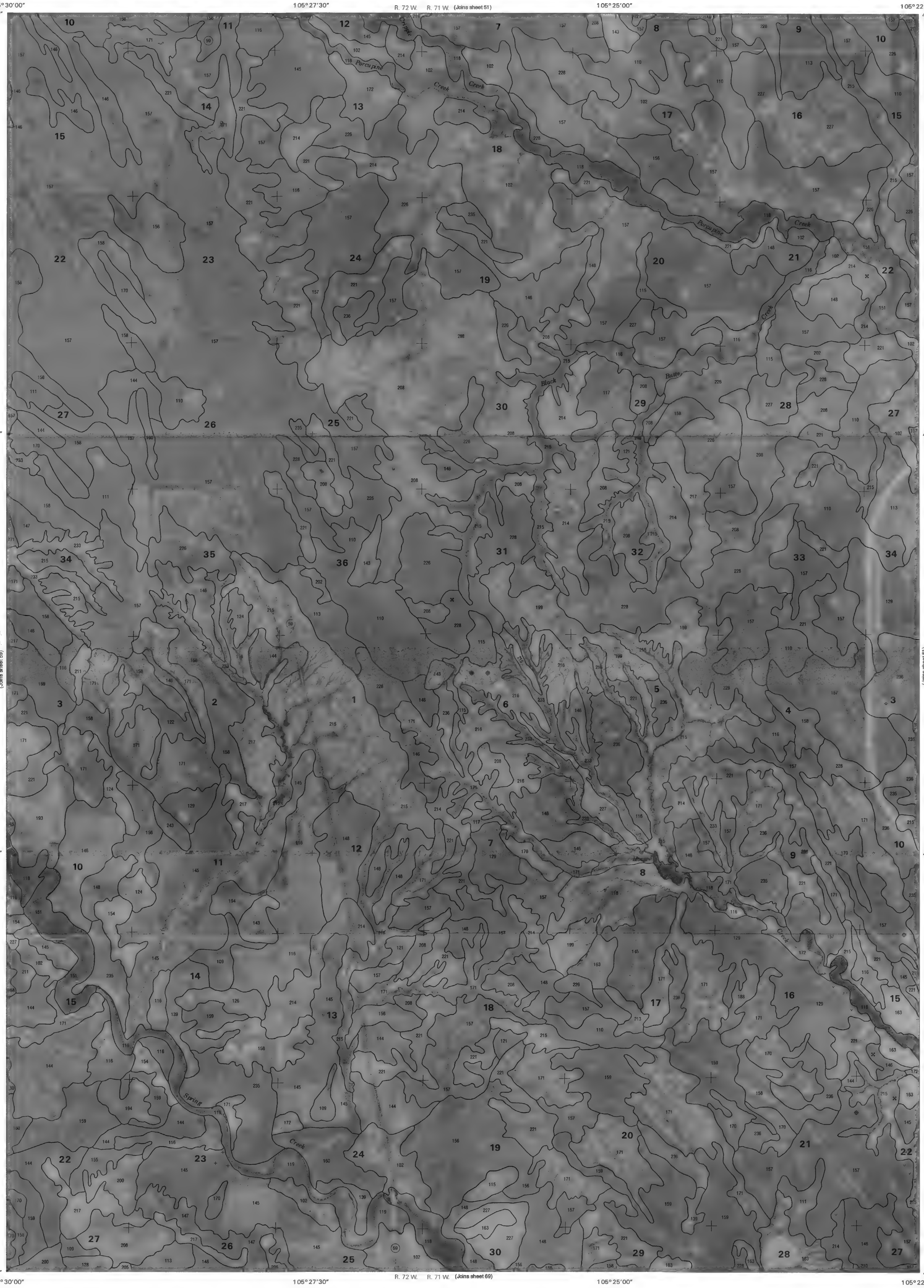
RENO FLATS, WYOMING
7.5 MINUTE SERIES
SHEET NUMBER 59 OF 71

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

CAMPBELL COUNTY, WYOMING, SOUTHERN PART
TECKLA SW QUADRANGLE
SHEET NUMBER 60 OF 72



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North American Datum of 1927 (NAD27). Clarke 1866 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUADRANGLE LOCATION

SCALE 1:24000

1 0 1 KILOMETERS

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

1 0 1 MILES

1 RATTLESNAKE DRAW
2 LITTLE THUNDER RESERVOIR
3 RENO RESERVOIR
4 RENO FLATS
5 TECKLA
6 COAL DRAW NORTH
7 BETTY RESERVOIR
8 DUGOUT CREEK NORTH

INDEX TO ADJOINING 7.5 MAPS

TECKLA SW, WYOMING
7.5 MINUTE SERIES
SHEET NUMBER 60 OF 72

105°22'30" 105°20'00" R. 71 W. R. 70 W. (Joins sheet 52) 105°17'30" 105°15'00"

43°37'30" 43°37'30"

43°35'00" 43°35'00"

T. 42 N.
T. 41 N.

(Joins sheet 60) (Joins sheet 62)

43°32'30" 43°32'30"

43°30'00" 43°30'00"

105°22'30" 105°20'00" R. 71 W. R. 70 W. (Joins sheet 70) 105°17'30" 105°15'00"

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North American Datum of 1927 (NAD27). Clarke 1866 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUADRANGLE LOCATION

SCALE 1:24000

1 0 1
KILOMETERS

1000 0 1000 2000 3000 4000 5000 6000 7000
FEET

1 0 1
MILES

1	2	3
4		5
6	7	8

1 LITTLE THUNDER RESERVOIR
2 RENO RESERVOIR
3 PINEY CANYON NW
4 TECKLA SW
5 PINEY CANYON SW
6 BETTY RESERVOIR
7 DUGOUT CREEK NORTH
8 COAL BANK DRAW

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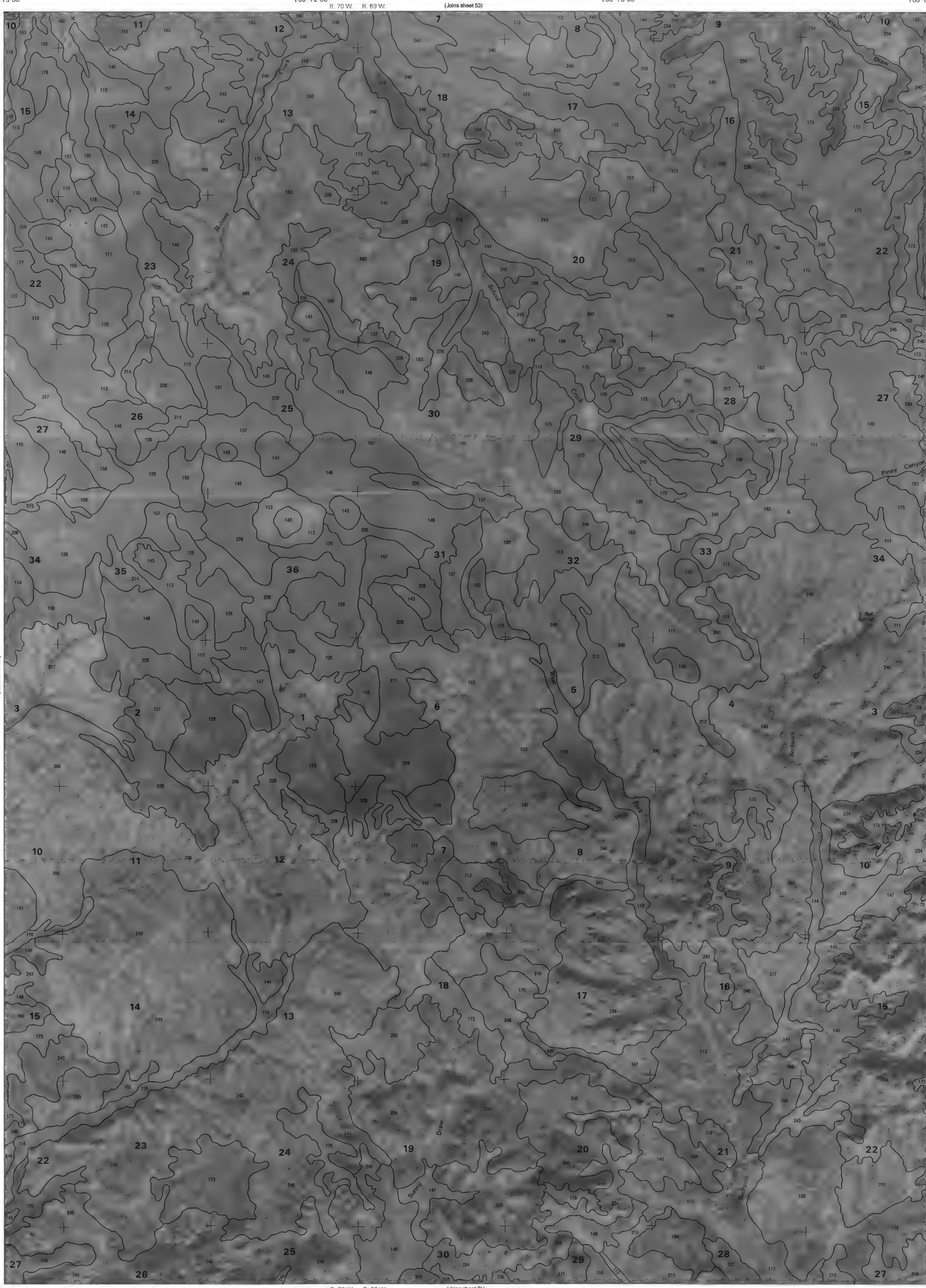
UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

CAMPBELL COUNTY, WYOMING, SOUTHERN PART
PINEY CANYON SW QUADRANGLE
SHEET NUMBER 62 OF 72



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North American Datum of 1927 (NAD27). Clarke 1866 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUADRANGLE LOCATION

SCALE 1:24000

KILOMETERS

FEET

MILES

1 RENO RESERVOIR
2 PINEY CANYON NW
3 PINEY CANYON NE
4 TECKLA
5 PINEY CANYON SE
6 DUGOUT CREEK NORTH
7 COAL BANK DRAW
8 FIDDLEBACK RANCH

INDEX TO ADJOINING 7.5 MAPS

PINEY CANYON SW, WYOMING
7.5 MINUTE SERIES
SHEET NUMBER 62 OF 72

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

CAMPBELL COUNTY, WYOMING, SOUTHERN PART
PINEY CANYON SE QUADRANGLE
SHEET NUMBER 63 OF 72

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North American Datum of 1927 (NAD27). Clarke 1866 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUADRANGLE LOCATION

SCALE 1:24000

KILOMETERS

FEET

MILES

1	PINEY CANYON NW
2	PINEY CANYON NE
3	DARLINGTON DRAW WEST
4	PINEY CANYON SW
5	LION CREEK
6	COAL BANK DRAW
7	FIDDLEBACK RANCH
8	WAGONHOUND CREEK

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PINEY CANYON SE, WYOMING
7.5 MINUTE SERIES
SHEET NUMBER 63 OF 72

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

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NORTH

QUADRANGLE LOCATION

SCALE 1:24000

1 0 1 KILOMETERS

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

1 0 1 MILES

1	2	3
4		5
6	7	8

1 LINCH
2 TAYLOR RANCH
3 ARTESIAN DRAW
4 EDGERTON
5 ROSS
6 GILLAM DRAW WEST
7 GILLAM DRAW EAST
8 MARSH DRAW

INDEX TO ADJOINING 7.5 MAPS

SAWMILL CANYON, WYOMING
7.5 MINUTE SERIES
SHEET NUMBER 64 OF 72

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NORTH

QUADRANGLE LOCATION

SCALE 1:24000

1 0 1
KILOMETERS

1000 0 1000 2000 3000 4000 5000 6000 7000
FEET

1 0 1
MILES

1	2	3
4		5
6	7	8

1 TAYLOR RANCH
2 ARTESIAN DRAW
3 PINE TREE
4 SAWMILL CANYON
5 ROSS FLAT
6 GILLAM DRAW EAST
7 MARSH DRAW
8 THOMPSON DRAW

INDEX TO ADJOINING 7.5 MAPS

ROSS, WYOMING
7.5 MINUTE SERIES
SHEET NUMBER 65 OF 72

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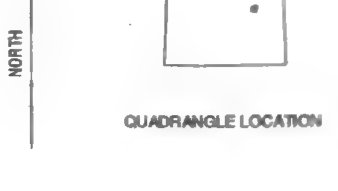
North American Datum of 1927 (NAD27). Clarke 1866 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.



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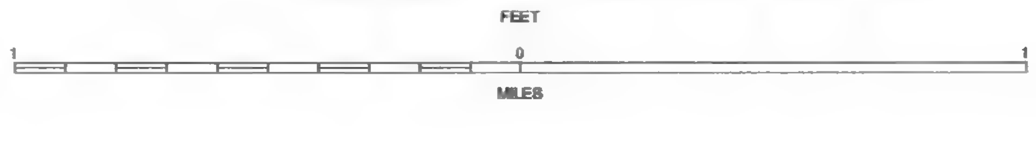

1	2	3
4		5
6	7	8

1 ARTESIAN DRAW
2 PINE TREE
3 TURNERCREST
4 ROSS
5 MACKEN DRAW
6 MARSH DRAW
7 THOMPSON DRAW
8 BEAR CREEK

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ROSS FLAT, WYOMING
7.5 MINUTE SERIES
SHEET NUMBER 66 OF 72

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

CAMPBELL COUNTY, WYOMING, SOUTHERN PART
MACKEN DRAW QUADRANGLE
SHEET NUMBER 67 OF 72

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North American Datum of 1927 (NAD27). Clarke 1866 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUADRANGLE LOCATION

SCALE 1:24000

KILOMETERS

FEET

MILES

1 PINE TREE
2 TURNERCREST
3 RENO FLATS
4 ROSS FLAT
5 COAL DRAW NORTH
6 THOMPSON DRAW
7 BEAR CREEK
8 COAL DRAW SOUTH

INDEX TO ADJOINING 7.5 MAPS

MACKEN DRAW, WYOMING
7.5 MINUTE SERIES
SHEET NUMBER 67 OF 72

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

CAMPBELL COUNTY, WYOMING, SOUTHERN PART
COAL DRAW NORTH QUADRANGLE
SHEET NUMBER 68 OF 72

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North American Datum of 1927 (NAD27). Clarke 1866 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUADRANGLE LOCATION

SCALE 1:24000

KILOMETERS

FEET

MILES

1 TURNERCREST
2 RENO FLATS
3 TECKLA SW
4 MACKEN DRAW
5 BETTY RESERVOIR
6 BEAR CREEK
7 COAL DRAW SOUTH
8 ALTA CREEK

INDEX TO ADJOINING 7.5 MAPS

COAL DRAW NORTH, WYOMING
7.5 MINUTE SERIES
SHEET NUMBER 68 OF 72

UNITED STATES
DEPARTMENT OF AGRICULTURE
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CAMPBELL COUNTY, WYOMING, SOUTHERN PART
BETTY RESERVOIR QUADRANGLE
SHEET NUMBER 69 OF 72

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North American Datum of 1927 (NAD27). Clarke 1866 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUADRANGLE LOCATION

SCALE 1:24000

KILOMETERS

FEET

MILES

1	2	3
4		5
6	7	8

1 RENO FLATS
2 TECKLA SW
3 TECKLA
4 COAL DRAW NORTH
5 DUGOUT CREEK NORTH
6 COAL DRAW SOUTH
7 ALTA CREEK
8 DUGOUT CREEK SOUTH

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BETTY RESERVOIR, WYOMING
7.5 MINUTE SERIES
SHEET NUMBER 69 OF 72

UNITED STATES
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NORTH

QUADRANGLE LOCATION

SCALE 1:24000

KILOMETERS

FEET

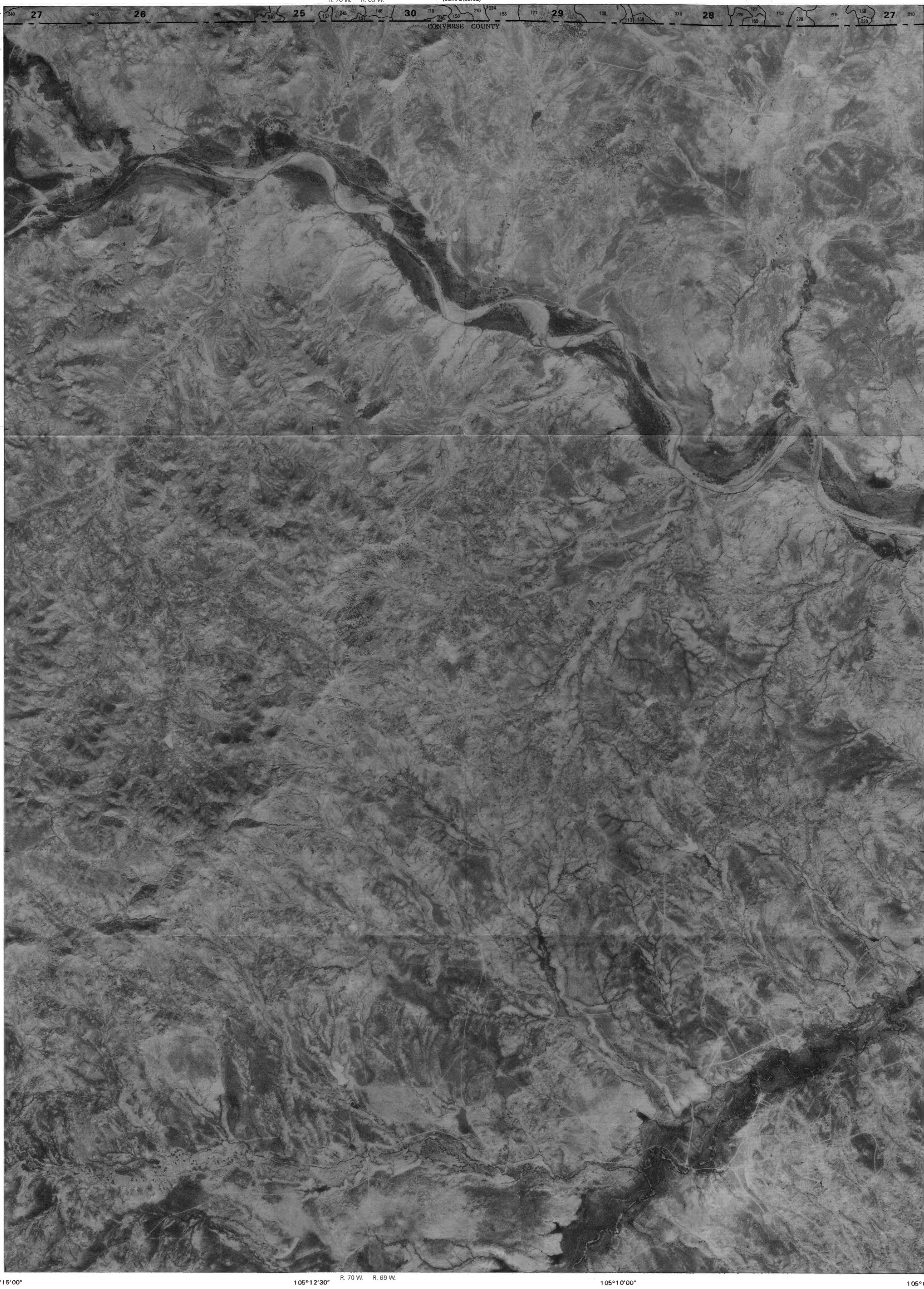
MILES

1	2	3
4		5
6	7	8

1 TECKLA SW
2 TECKLA
3 PINEY CANYON SW
4 BETTY RESERVOIR
5 COAL BANK DRAW
6 ALTA CREEK
7 DUGOUT CREEK SOUTH
8 TIN CAN LAKE

INDEX TO ADJOINING 7.5 MAPS

DUGOUT CREEK NORTH, WYOMING
7.5 MINUTE SERIES
SHEET NUMBER 70 OF 72



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North American Datum of 1927 (NAD27). Clarke 1866 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUADRANGLE LOCATION

SCALE 1:24000

KILOMETERS

FEET

MILES

1	2	3
4		5
6	7	8

1 TECKLA
2 PINEY CANYON SW
3 PINEY CANYON SE
4 DUGOUT CREEK NORTH
5 FIDDLEBACK RANCH
6 DUGOUT CREEK SOUTH
7 TIN CAN LAKE
8 ESAU SPRING

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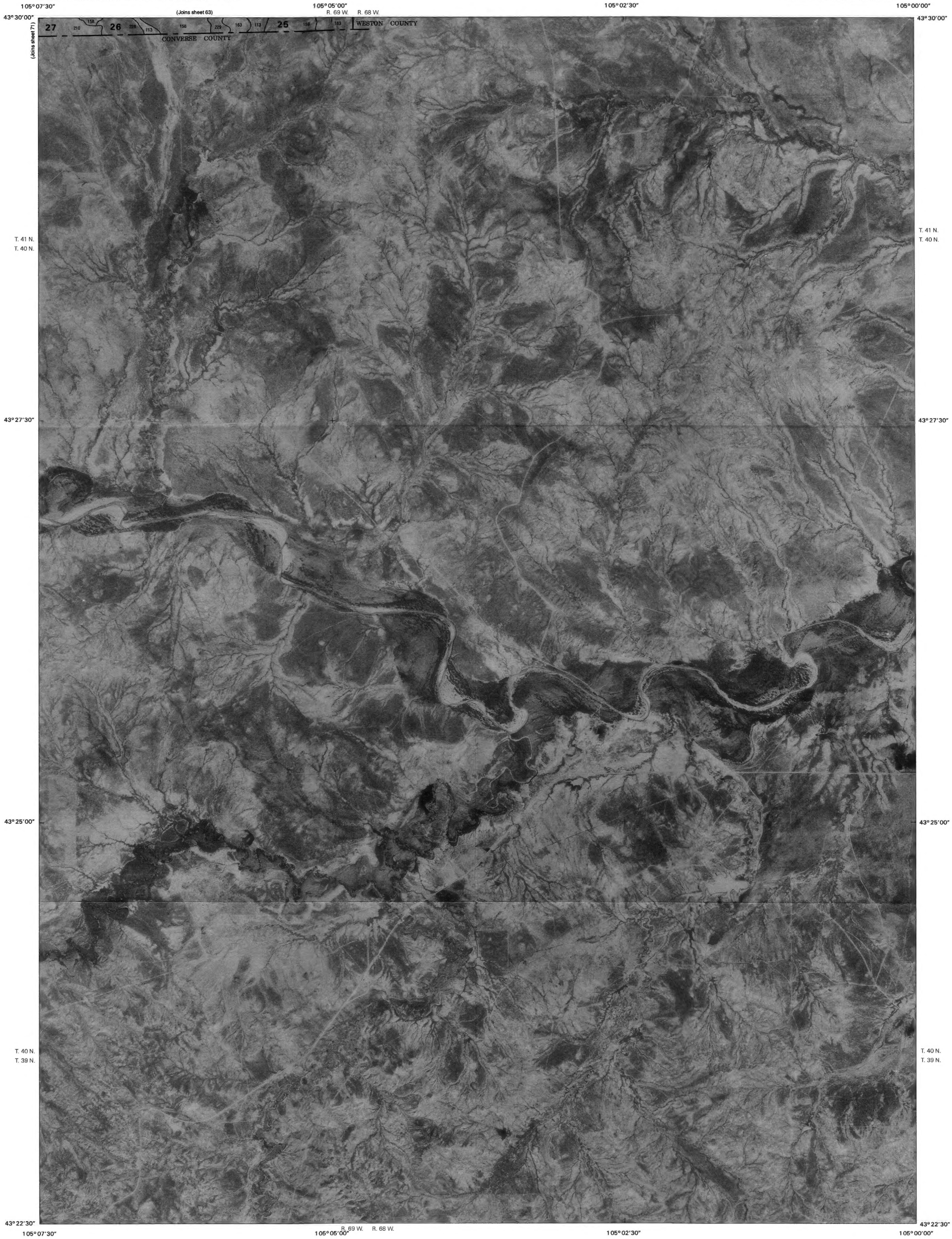
COAL BANK DRAW, WYOMING

7.5 MINUTE SERIES
SHEET NUMBER 71 OF 72

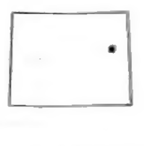
UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE



This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service, formerly Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey, from 1974 - 1979 aerial photography.

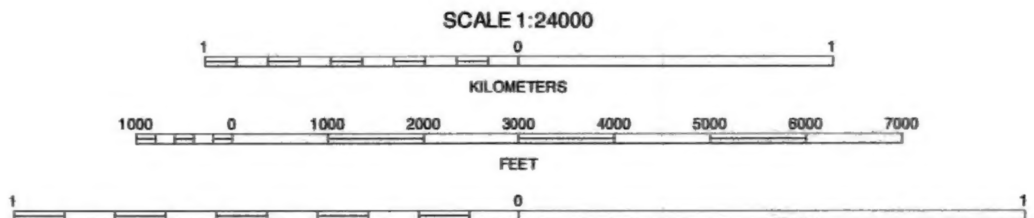
North American Datum of 1927 (NAD27). Clarke 1866 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 13. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH



QUADRANGLE LOCATION

SCALE 1:24000



1	2	3
4		5
6	7	8

1 PINEY CANYON SW
2 PINEY CANYON SE
3 LION CREEK
4 COAL BANK DRAW
5 WAGONHOUND CREEK
6 TIN CAN LAKE
7 ESAU SPRING
8 PINNACLE ROCKS

INDEX TO ADJOINING 7.5 MAPS

FIDDLEBACK RANCH, WYOMING
7.5 MINUTE SERIES
SHEET NUMBER 72 OF 72